


# **STATE OF FLORIDA**



## **FY2017 SECTION 319(h) GRANT WORK PLAN**



**Submitted September 2016**

**Florida Department of Environmental Protection**

**Division of Water Restoration Assistance**

**Nonpoint Source Management Section**

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## INTRODUCTION TO FLORIDA'S FY2017 SECTION 319(h) WORKPLAN

**Commented [BK1]:** Comments have been added to help navigate changes in the revised workplan. However, some items are replies only in the Comments document.

This FY2017 Section 319(h) Draft Work Plan consists of twelve projects that were selected for Section 319 grant funding, along with four additional projects to fund the state's nonpoint source management program. In the winter of 2016, grant solicitation packages were sent out statewide and placed upon the Department's website. Department staff reviewed and evaluated all 40 of the proposals submitted. Projects were prioritized for grant funding using the Project Evaluation Criteria included in the grant solicitation package and the best professional judgment of Department staff. The projects were then presented to the Division's senior managers for final approval of the projects selected for funding.

The selected projects contribute to the implementation of the Department's Nonpoint Source Management Plan (Plan). There are four DEP program projects, one statewide education project with a state university and one urban stormwater project with a local government under the Program Funding category. The four DEP program projects are the NPS Administration activities, the Sediment and Erosion Control Inspector training program, the Green Industries BMP training program and the bioassessment program. For two of the DEP program projects, there is an entire Section in the plan discussing each project. Section 2 of the NPS Management Plan (Plan) describes the NPS Grant and Funding Administrative activities and Section 10 of the Plan describes the bioassessment program activities. The Sediment and Erosion Control and Green Industries BMP programs are urban educational activities which are identified as a priority in addressing urban stormwater pollution. There are two projects funded with local or state governments that are outside of the BMAP areas that are consistent with areas of concern identified in the Agriculture and Urban sections of the Plan. One is an agricultural demonstration project and the other is an urban stormwater project. There are six projects with other government entities, local and state level, under the Watershed funding category. The selected projects and the majority of the Watershed funded projects are in the high priority areas identified in the Plan. There are 7 BMAP areas (Tier I) that are identified as the higher priority out of the 20+ BMAP areas identified in the Plan. One of the 7 program projects is in a priority watershed area. Five of the seven Watershed Funded projects are in these top seven, Tier I, priority BMAP areas. Three of the projects are targeted at reducing nutrients from urban stormwater which is identified in the Plan as a high priority for the Department. One of the projects targets reducing pollution from septic tanks through the elimination of septic systems. Septic systems are identified in the NPS Management Plan as being a source of nutrient pollution to Florida springs, surface and coastal systems. There is also one agriculture demonstration project under the Watershed funding category. Two projects are education projects which is also a DEP management plan priority activity.

The specific references on how the projects are linked to the NPS Management Plan are provided in Table 1.

### NATIONAL WATER QUALITY INITIATIVE

The Department continues to work with the National Resource Conservation Service (NRCS) on the National Water Quality Initiative (NWQI). The Department is not requesting funding at this time for the NWQI but a state-funded DEP staff coordinates with NRCS on the NWQI watershed selection and monitoring activities. There are currently three watersheds identified for the NWQI funding. Two are in the northeast part of the state, Deep Creek and Clarks Creek, and one is in the panhandle, Little Scurlock Creek. Monitoring is currently going on at a farm in the Clarks Creek area. NWQI funding will continue in these areas for the coming year.

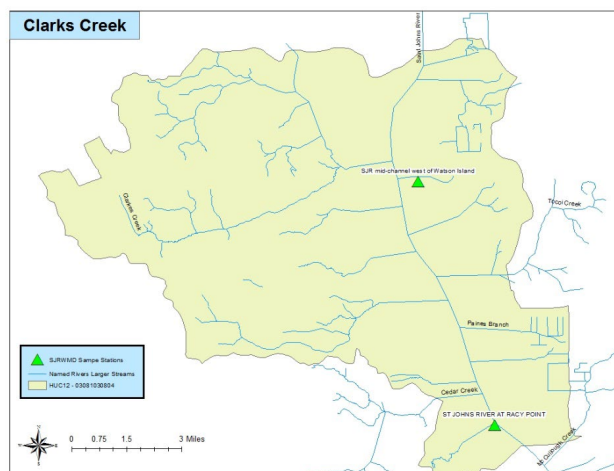
The Department is coordinating with the St. Johns Water Management District to obtain water quality data in the Clarks Creek and Deep Creek Watersheds. Department staff is conducting the monitoring activities in the Little Scurlock Creek area. A summary of the ongoing monitoring activities is below.

The St. Johns Water Management District monitors water quality in the Clarks Creek Watershed. Two locations are monitored monthly for the analytes in the table below.

Analysis Type	Parameters
Field Measurements	Dissolved Oxygen; pH; Salinity; Sample Depth; Secchi Depth; Specific Conductivity; Temperature
Water Quality Analysis	Alkalinity, Aluminum, Ammonia, Antimony, Arsenic, Barium, BOD-5 day, Cadmium, Calcium, Chloride, Chlorophyll-a, Chromium 3, Chromium III, Color, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Nitrite-Nitrate (NO <sub>2</sub> NO <sub>3</sub> ), Pheophytin-a, Phosphorus, Potassium, Selenium, Silver, Sodium, Sulfate, Thallium, Total Kjeldahl Nitrogen, Total Organic Carbon, Total Silicon, Total Suspended Solids, Turbidity, Un-ionized Ammonia, Volatile Solids Suspended In Mixed Liquid, Zinc

Station ID	Station Name	Latitude	Longitude	Start Sample Date	*Last Sample Date
21FLSJWMSJWSIL	SJR mid-channel west of Watson Island	29.895	- 81.594722	1997	Current
21FLSJWMSRP	ST JOHNS RIVER AT RACY POINT	29.798889	- 81.564444	1997	Current

\*The last sample date where data is available.

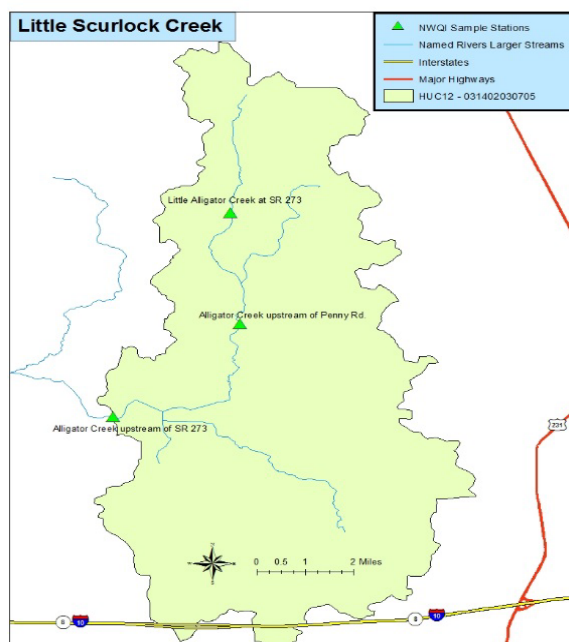


The Department's NWQI coordinator met with NRCS and the Department's sampling staff at the Little Scurlock site to develop a sampling plan for that area. The Florida Department of Environmental Protection is collecting water quality samples quarterly from three locations in the Little Scurlock Creek (also known as Alligator Creek) watershed for NWQI. Bioassessments will be collected twice in 2016 from one station as part of Florida's 303(d) assessment monitoring. The analytes being monitored are listed in the table below.

Analysis Type	Parameters
Field Measurements	Dissolved Oxygen; pH; Salinity; Sample Depth; Secchi Depth; Specific Conductivity; Temperature
Water Quality Analysis	Alkalinity; Ammonia (NH <sub>4</sub> ); BOD-5 day; Chloride; Chlorophyll-a (Corrected); Color (True); Fluoride; Nitrite-Nitrate (NO <sub>2</sub> NO <sub>3</sub> ); Orthophosphate-filtered; Pheophytin-a; Sulfate; Total Dissolved Solids; Total Kjeldahl Nitrogen; Total Organic Carbon; Total Phosphorus; Total Suspended Solids; Turbidity
Bioassessments	Rapid Periphyton Survey, Linear Vegetation Survey

Station ID	Station Name	Latitude	Longitude	Start Sample Date	*Last Sample Date
G3WA0003	Alligator Creek upstream of Penny Rd.	30.8517	-85.4653	2015	2016
G3WA0005	Alligator Creek upstream of SR 273	30.819	-85.5042	2015	2016
G3WA0006	Little Alligator Creek at SR 273	30.88873	-85.46802	2015	2016

\*The last sample date where data is available.

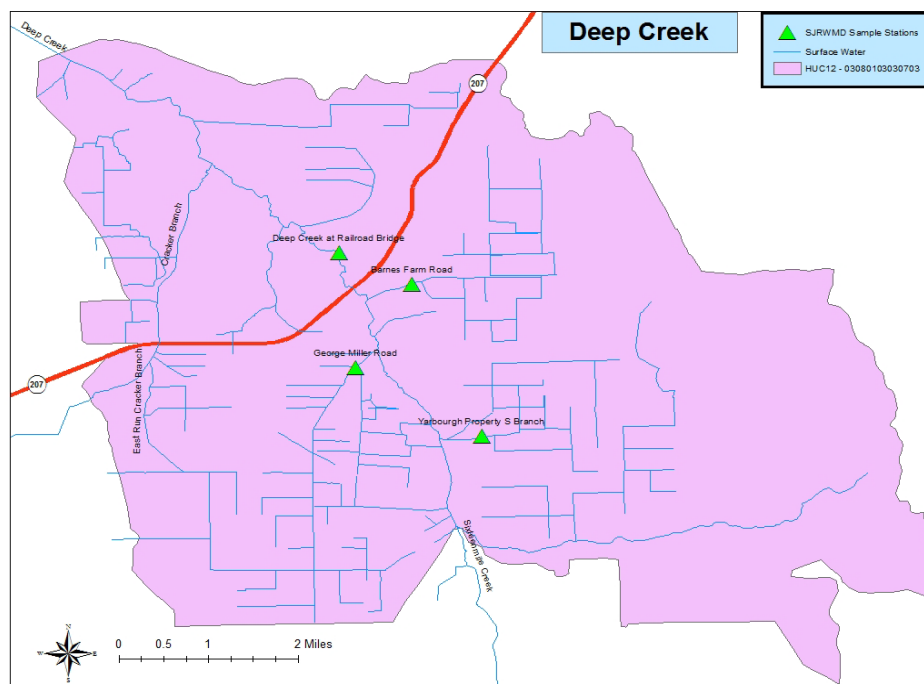


The St. Johns Water Management District monitors water quality in the Deep Creek watershed. Four locations are monitored monthly for the analytes in the table below.

Analysis Type	Parameters
Field Measurements	Dissolved Oxygen; pH; Salinity; Sample Depth; Secchi Depth; Specific Conductivity; Temperature
Water Quality Analysis	Alkalinity, Aluminum, Ammonia, Antimony, Arsenic, Barium, BOD-5 day, Cadmium, Calcium, Chloride, Chlorophyll-a, Chromium 3, Chromium III, Color, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Nitrite-Nitrate (NO <sub>2</sub> NO <sub>3</sub> ), Pheophytin-a, Phosphorus, Potassium, Selenium, Silver, Sodium, Sulfate, Thallium, Total Kjeldahl Nitrogen, Total Organic Carbon, Total Silicon, Total Suspended Solids, Turbidity, Un-ionized Ammonia, Volatile Solids Suspended In Mixed Liquid, Zinc

Station ID	Station Name	Latitude	Longitude	Start Sample Date	*Last Sample Date
21FLSJWM3F05YARS	Yarborough Property S Branch	29.6988	-81.463836	1997	current
21FLSJWM3F07GMR	George Miller Road	29.710275	-81.484294	1997	current
21FLSJWM3F08BFR	Barnes Farm Road	29.724206	-81.475208	1997	current
21FLSJWMDPB	Deep Creek at Railroad Bridge	29.729575	-81.486978	1997	current

\*The last sample date where data is available.



## PROGRAM PROJECTS

Over the past 25 years, the state has implemented a wide variety of nonpoint source management programs involving numerous state agencies, the water management districts, and local governments. These programs include non-regulatory and regulatory components, technical assistance, education, technology transfer, extensive interagency coordination and monitoring. The programs include both surface water and groundwater elements.

The Department's FY2017 program seeks to undertake projects that will increase the environmental effectiveness of our NPS programs, to continue expanding our knowledge about the potential effects of various nonpoint sources on ground and surface waters, and to continue expanding our knowledge about the effectiveness of Best Management Practices (BMPs) in protecting ground and surface waters.

The projects described in this section of the Work Plan for program funding are intended to provide for:

- Administration of the program and management of selected sub-grantee projects;
- Improvement to the state's surface water NPS bioassessment program;
- Implementation of the Stormwater Erosion and Sedimentation Control Inspector training program;
- Oversight and coordination of the state's National Water Quality Initiative (NWQI) activities;
- Public education designed to reduce individual's contributions to the nonpoint pollution problem, including misuse and overuse of fertilizers;
- Continuation of the Florida yards and Neighbors Sustainability of the Florida Friendly Landscaping™ Program (FYN), to protect water resources by educating Florida residents on "Florida Friendly" landscaping practices that reduce nonpoint source pollution from yards and other landscapes. This year's grant request will: continue the statewide coordination of the county FYN programs to implement the milestones set forth in the Action Plan for NPS Management Program Administration dated 2015;
- Implementation of one local project in Martin County, outside of the adopted BMAP areas.

**Project 1, NPS Program Administration.** Support of the Nonpoint Source Management Section includes supporting the state's efforts to manage the restoration contracts associated with the incremental funding, oversee the NWQI program, assist with development of the state's Best Management Practice manuals as well as for additional tasks, such as updating the EPA Grants Reporting Tracking System. This funding provides support for staff, travel, and other expenses that are otherwise unavailable. This project implements the milestones set forth in the Action Plan for NPS Management Program Administration in the 2015 Program Update.

**Project 2, Implementation of the Florida Stormwater Erosion and Sedimentation Control Inspector Training Program.** This program has been implemented since 1997 as a two-day course designed to train construction workers and consultants on proper sediment and erosion control BMP installation, maintenance, and inspection. This grant will continue to support the continuation of that program through its established, trained instructors. This grant will also support the implementation of an advanced course designed to further increase the effectiveness of the state's National Pollutant Discharge Elimination System (NPDES) stormwater permitting program by assuring that properly trained inspectors are available for sites with disturbed soils. The advanced course will be designed to include an interactive field day that will highlight proper sediment and erosion control BMP installation, maintenance, and inspection. The advanced course will be aimed at construction workers and consultants and provide hands-on opportunities to learn about erosion and sedimentation control. This project implements the milestones set forth in the Action Plan for NPS Management Program Administration in the 2015 Program Update.

**Project 3, Green Industries BMP Training Program.** The Green Industries Best Management Practices (BMP) for Protection of Water Resources in Florida Training program was developed to provide Green Industry professionals with the knowledge, tools and skills to minimize the environmental impacts of non-point sources of pollution related to their business practices. This program is currently delivered statewide by the University of Florida's Institute for Food and Agricultural Sciences (IFAS) and is based on partnerships between Landscape and Green Industry businesses, local municipalities, scientists and homeowners. Regional coordination takes place through the UF-IFAS Extension offices across the state.

**Project 4, Bioassessment Program.** The responsibility for monitoring the condition of Florida's surface and ground water resources lies with Florida Department of Environmental Protection (DEP) and its restoration partners, including the WMDs and local governments. Overarching goals driving DEP's bioassessment program include assessment of waterbodies, determination of Total Maximum Daily Loads (TMDL), determination of appropriate Site Specific Alternative Criteria, allocation of loads, restoration of waterbodies, and development of scientifically-based assessment tools. This project is designed to increase our ability to monitor and assess the effects of NPS pollutants, the effectiveness of BMPs, and the effectiveness of the NPS management program. This project implements the milestones set forth in the Action Plan for NPS Management Program Administration in the 2015 Program Update.

**Project 5, Florida Friendly Yards and Neighborhoods, University of Florida**

The primary goal of the FFL program is to educate Floridians about the relationship between their landscaping choices and the environmental impacts of those choices. Through this education effort FFL seeks to change people's behavior so that they adopt landscape practices that protect Florida's water resources, as well as save time and money. This project continues more than twenty years of partnership between EPA, DEP, and UF/IFAS to support local and regional projects that introduce and increase awareness of FFL principles. The success of the program has led to more demand than ever for statewide oversight and guidance to further the implementation of a fully integrated statewide FFL program with regional flexibility.

The FFL program promotes urban landscape design and landscaping best management practices that reduce contaminant loading to surface and groundwater. The proposed FFL programs will help reinforce the FFL messages throughout the state by complementing current projects throughout Florida.

**Project 6, Willoughby Creek, Martin County, FL**

The project proposes to construct an approximately 8-acre combination deep, wet detention lake and shallow treatment wetland. The treatment wetland will be configured in a treatment train system, planted with native herbaceous upland and aquatic plants. The purpose of the treatment train system is to reduce the velocities, and maximize storage capacity, attenuation and residence time in order to achieve the most possible pollutant load reductions within the deep, wet detention lakes, for physical settling of the suspended solids. Further polishing of the stormwater through the biological uptake of nutrients by the vegetation planted in the treatment wetlands will provide additional water quality treatment. The project will be designed to provide ground water recharge and improve timing of fresh water discharges to the St. Lucie Estuary.

**WATERSHED PROGRAM PROJECTS**

**Projects 7-12:** The remaining six local projects competitively selected for funding will meet a variety of urban and agricultural related stormwater needs. All of these selected projects implement Best Management Practices (BMP) in BMAPs (Basin Management Action Plans) and are identified as Watershed projects. Additionally, these projects all meet the goals set out in the NPS Management Plan for NPS Management Program 2015 Program Update. Scopes for the selected projects are included below.



### **Outputs for Project #s: 3, 5, 6-12**

Output: Final Report

Final Reports include the following information:

- Project location and background, project description and timeline, grant award amount and anticipated benefits.
- Financial summary of actual costs versus the budget, along with any changes required to the budget. Include any match provided, along with other related project work performed outside of this Agreement to identify the overall project cost.
- Discussion of project schedule versus actual completion, including changes required to the schedule, unexpected site conditions and adjustments, significant unexpected delays and corrections, and/or other significant deviations from the original project plan.
- Summary of activities completed as well as those not completed and why, as well as a brief summary of any additional phases yet to be completed.
- Photo documentation of work performed (before, during and after), appropriate figures (site location, site plan[s], etc.), appropriate tables summarizing data/information relevant to Grant Work Plan tasks, and appropriate attachments relevant to the project.
- Discussion of whether the anticipated benefits have been/will be realized (e.g., why a BMP did or did not exceed the expected removal efficiency)
- Summary of monitoring activities completed and any not completed and why, monitoring results, and an interpretation of data based on planned versus realized results (this bullet applies to only Projects: 6, 7, 8, 10, &12)
- Documentation of any environmental results including load reductions, potential success story data/information, and any other water quality improvement information
- Description of any partnerships related to the project.
- Describe BMAP information related to this project if applicable.

Commented [BK2]: Added per Tiana's request.

TABLE 1. FY17 Grant Funding Request, Project Selection

Program Funding Projects:

Project	Type/Mgmt Plan location	Title	Lead Agency	Watershed	FY17 319 Funding	FY17 319 Match Funds
1	NPS Admin, Mgmt Plan pg. 31/ Appendix 2.0	NPS Program Management	FL DEP	Statewide	\$1,235,888.64	\$587,321.34
2	Urban, Mgmt Plan Pg. 38/ Appendix 3.0	Stormwater, Erosion, and Sedimentation Control	FL DEP	Statewide	\$133,408	N/A*
3	Urban, Mgmt Plan Pg. 38/ Appendix 3.0	GI BMP	University of Florida	Statewide-Non BMAP Areas	\$211,645	N/A*
4	Urban, Mgmt Plan pg. 112/ Appendix 10.0	Bioassessment	FL DEP	Statewide	\$260,282	\$129,256
5	Urban, Mgmt Plan Pg. 38/ Appendix 3.0	FL Friendly Yards and Landscaping	University of Florida	Statewide-Non BMAP Areas	\$378,152.88	\$252,101.92
6	Urban Mngmt.	Willoughby Creek	Martin County	IRL	\$475,200	\$352,000
					<b>\$2,694,576.52</b>	<b>\$1,320,679.26</b>

\*Since these are DEP programs, there is no match needed. The other 2 DEP programs are using salaries for match.

TABLE 2. FY17 Grant Funding Request, Project Selection (Continued)

Watershed Projects:

Project	Type/Mgmt Plan location	Title	Lead Agency	Watershed	FY17 319 Funding	FY17 319 Match Funds
3.1	Urban, Mgmt Plan Pg. 38/ Appendix 3.0	GIBMP	University of Florida	Statewide-BMAP Areas	99597.76	n/a*
5.1	Urban, Mgmt Plan Pg. 38/ Appendix 3.0	FL Friendly Yards and Landscaping	University of Florida	Statewide-BMAP Areas	186,254.40	124169.6
7	Other/Water Quality Demo/Ag Mngmt Plan Pg 25	McCarthy Ranch Water Farming	Port St. Lucie	St. Lucie River and Estuary	642,301	455,670
8	Urban/Mgmt Plan Pg. 25, Appendix 1-3.2(a)	Nalle Grade <b>DELETED</b>	Lee County	Caloosahatchee	N/A	N/A
9	Education/ Plan Appendix I, 3.1	FDEP Watershed Education Project	FL DEP BMAP Group	Adopted BMAPs	1,075,000	716,666.67
10	Urban/Mgmt Plan Pg. 25, Appendix 1-3.2(a)	Cone Road	Merritt Island	IRL	400,000	374,000
11	Education/ Plan Appendix I, 3.1	Think About Personal Pollution	City of Tallahassee	Wakulla Springs	320,000	620,000
12	OSTDS/Mgmt Plan Pg 25; #8 OSTDS Program, Pg. 99/ Appendix 1 – 8.1(a)	Island Lake	City of Longwood	Middle St. Johns River	407,070	271,380
13	OSTDS/Mgmt Plan Pg 25; #8 OSTDS Program, Pg. 99/ Appendix 1 – 8.1(a)	BMPs for Non-Propriety Passive Nitrogen Reducing OSTDS	FL Department of Health	Multiple BMAP areas	60,000	40,000
		Projects to be Selected	TBD	TBD	440,000	293,300
<b>Watershed Total</b>					<b>\$3,630,223</b>	<b>\$2,178,552.60</b>
<b>FY 17 Total Grant Request</b>					<b>\$6,324,800.00</b>	<b>\$ 5,228,467.53</b>

**Commented [BK3]:** Note that we did remove this project due to MS4 conflicts.

**Commented [BK4]:** Added Project.

**Commented [BK5]:** You will note the gap of 440k here in the table. We are working to fill this ASAP.

**FLORIDA'S FY2017 SECTION 319(h) Workplan**

**PROJECT 1**

**PROJECT NAME:** NPS/Watershed Management Program Administration

**PROJECT FUNDING:** \$1,215,889                      **MATCH:** \$587,321.34

**LEAD ORGANIZATION:** Florida Department of Environmental Protection

**PROJECT ABSTRACT:** Florida's NPS Management Program identifies the natural resource management programs, strategies, and resources that currently are in place or that are needed to minimize or prevent nonpoint source pollution effects. The Nonpoint Source Management Program identifies BMPs to control pollution from specific sources of nonpoint source pollution (e.g., agriculture, forestry, OSTDS, urban); identifies programs to assure implementation of programs, activities, and structural and nonstructural BMPs that will minimize or reduce NPS pollution; and coordinates restoration activities with other state and local entities, especially those leading to restoration of impaired waters. Section 319 grant financial support allows the Nonpoint Source Management Section staff to properly administer the grant, to assure that all projects are properly completed, and to enhance the effectiveness of the state NPS/watershed management program.

**PROJECT DESCRIPTION:** The funds will pay the salaries of 1) a Program Administrator to oversee management of the program; 2) seven Environmental Specialists to manage selected projects; 3) a Nonpoint Agricultural Environmental Specialist to work on the National Water Quality Initiative and review agricultural BMPs and 4) two Environmental Specialist OPS positions to manage selected projects. Requested funding also covers travel expenses of DEP staff to meet with project sub-grantees on-site to ensure accountability of project funding, and provide site-specific nonpoint source expertise and to travel to EPA Nonpoint Source Workshops and to provide for travel needed in order to assist in the development and implementation of TMDLs.

**GOALS:**

<b>Goal:</b> Successfully manage the 319 grant program.
<b>(a) Action:</b> Reduce the unliquidated obligations (ULOs) by utilizing leftover funds, emphasizing the five-year time frame in the proposal and selection process and evaluating the project contracting process.
<b>(b) Action:</b> Evaluate and update the NPS Management Plan on an ongoing basis and at least every five years.
<b>(c) Action:</b> Maintain 319 project data in the GRTS system.
<b>Goal:</b> Develop a centralized system to track all NPS restoration projects managed by the NPS Program or geared toward BMAP implementation.
<b>(a) Action:</b> Evaluate systems for suitability
<b>Goal:</b> Administer an effective NPS management program.
<b>(a) Action:</b> Provide technical expertise on issues relating to NPS management through meetings and inter-and intra-agency cooperation.
<b>(b) Action:</b> Provide educational materials and training on NPS management.

**PROJECT BUDGET – GRANT FUNDING**

<b>NPS Admin Project Funding Activity</b>	<b>319 (h) Amount</b>
1 Environmental or Program Administrator	63,000.00
Fringe Benefits (69.94%)	44,062.20
1 Environmental Specialist	43,000.00
Fringe Benefits (69.94%)	30,074.20
1 Environmental Specialist	47,000.00
Fringe Benefits (69.94%)	32,871.80
1 Environmental Specialist	47,000.00
Fringe Benefits (69.94%)	32,871.80
1 Environmental Specialist	43,000.00
Fringe Benefits (69.94%)	30,074.20
1 Environmental Specialist	45,000.00
Fringe Benefits (69.94%)	31,473.00
1 Environmental Specialist	43,000.00
Fringe Benefits (69.94%)	30,074.20
1 Environmental Specialist	45,000.00
Fringe Benefits (69.94%)	31,473.00
Nonpoint Agriculture Environmental Specialist	50,000.00
Fringe Benefits (69.94%)	34,970.00
1 OPS Environmental Specialist	43,000.00
Health	8,000.00
FICA (1.45%)	623.50
1 OPS Environmental Specialist	43,000.00
Health	8,000.00
FICA (1.45%)	623.50
Travel	20,000.00
Indirect (46.99%)	388,697.24
<b>Total:</b>	<b>1,235,888.64</b>

**MATCH FUNDED POSITIONS:**

<b>2017 Program Match Positions</b>	<b>Match Funding</b>
1/4 Director, Division of Environmental Assessment and Restoration	\$28,750.00
1/4 Fringe Benefits (69.94%)	\$5,026.94
1/4 DEAR Budget Director	\$13,750.00
1/4 Fringe Benefits (69.94%)	\$9,616.75
1 Environmental Consultant – Basin Management Action Plan Coordinator	\$51,000.00
Fringe Benefits (69.94%)	\$35,669.40
1 Environmental Consultant – Basin Management Action Plan Coordinator	\$51,500.00
Fringe Benefits (69.94%)	\$36,019.00
1 Environmental Consultant – Basin Management Action Plan Coordinator	\$47,780.00
Fringe Benefits (69.94%)	\$33,417.00
DWRA Director 1/4 Salary	\$28,500.00
1/4 Fringe Benefits (69.94%)	\$4,983.23
DWRA Staff Director 1/4th	\$20,000.00
1/4 Fringe Benefits (69.94%)	\$3,497.00
DWRA Budget Director 1/4	\$17,505.00
1/4 Fringe Benefits (69.94%)	\$3,060.75
DWRA Admin Assistant 1/4	\$8,078.00
1/4 Fringe Benefits (69.94%)	\$1,412.44
Indirect (46.99%)	\$187,755.83
<b>Total:</b>	<b>\$587,321.33</b>

## PROJECT 2

**PROJECT NAME:** Stormwater, Erosion, and Sedimentation Control Certification Program

**PROJECT FUNDING:** \$133,408

**LEAD ORGANIZATION:** Florida Department of Environmental Protection

**FISCAL YEAR:** 2017

**PROJECT ABSTRACT:** Implementation of the Florida Stormwater, Erosion, and Sedimentation Control *Inspector* Qualification Training program (FSESCI) began in late 1997. Since inception of the program, over 35,752 inspectors have been trained throughout the State of Florida. This training program is a two day class which follows the curriculum provided in the Florida Stormwater, Erosion, and Sedimentation Control *Inspector* Training Program Manual. Upon completion of the class, a proctored examination is administered. In order to obtain the qualification as an inspector, individuals must receive a minimum passing grade of 70 percent on the examination.

An outdoor workshop is also provided which is titled “Florida Muddy Water Blues.” It is an outdoor portion of the regular FSESCI class, and allows attendees to observe various stormwater erosion and sedimentation control practices and BMPs in use. A variety of volunteer erosion sediment control suppliers are on hand to provide technical specifications of products and demonstration proper installations and applications.

Additionally, the Department offers train-the-trainer (T3) workshops designed to prepare new instructors for implementation of the inspector’s training program. In order to attend the train-the-trainer workshop, all participants must be FDEP Qualified Inspectors prior to the scheduled workshop date. Prospective trainers must also achieve a minimum score of 80% on the FSESCI proctored examination. The T3 workshop covers procedures and guidelines that instructors are required to follow in order to teach the FSESCI class. Instructors must provide their resumes which are reviewed for experience levels and each instructor is evaluated on their teaching skills and speaking abilities prior to becoming a qualified instructor.

**PROJECT DESCRIPTION:** Florida’s NPDES Stormwater regulatory program requires the use of appropriate BMPs during construction to minimize erosion and sedimentation and appropriate BMPs after construction to treat runoff as well as inspections every seven days and within 24 hours after a half inch rain event. The Stormwater, Erosion, and Sedimentation Control Certification Program has been in place since 1997.

The goal of the Stormwater, Erosion, and Sedimentation Control Certification Program is to increase the proper design, construction and maintenance of erosion and sediment controls during construction and to assure the proper long-term operation and maintenance of stormwater systems after construction is completed. The primary program objective is to provide training throughout the State of Florida to both public and private employees in various construction-related fields. The target audience for the training program is inspectors, contractors, and engineers. The inspector training program is a two-day class that includes topics related to stormwater, erosion, and sediment control BMPs. At the end of the second day, a proctored exam made up of 100 multiple-choice questions is administered. In order to qualify as a certified inspector by the Department, a passing score of 70% must be obtained. Additionally, classes are

held to trainer instructors in the program. Prospective trainers must achieve a minimum score of 80% on the proctored exam.

Because of the wide success of the program, DEP now believes that it has trained enough instructors to carry on the existing program. DEP will continue to provide materials to those instructors who offer open-enrollment courses for free. DEP believes that advanced training is now needed to ensure that construction sites reduce and eliminate erosion and sedimentation that impact our waters. DEP has therefore created the new Construction Erosion and Sedimentation Control *Advanced* Certification Program. The advanced course will be designed to include an interactive field day that will highlight proper sediment and erosion control BMP installation, maintenance, and inspection. The advanced course will be aimed at construction workers and consultants and provide hands-on opportunities to learn about erosion and sedimentation control. At this time, this advanced course is intended to be implemented alongside the existing training program.

Federal grant funding will be used to continue the program's one staff position. This position coordinates the implementation of the training courses at locations throughout the state of the existing Stormwater, Erosion, and Sedimentation Control Certification Program. This person will also research and create a new Field Manual to be utilized in the new Construction Erosion and Sedimentation Control Advanced Certification Program. In addition to these responsibilities, over the next year the department intends to: conduct a revision to the program manual, host a trainer workshop, which is intended to bring together the trainers from throughout the state to provide the latest revisions for the program, develop electronic classroom training opportunities and lastly, strive to increase trainer participation throughout the state in order to meet the demands for the class.

#### PROJECT MILESTONES:

Action: Coordinate with local and regional stakeholders to "train the trainers" for the statewide training on erosion and sediment control BMPs, through BMP manuals, classroom training, outdoor exercises, and video-conferencing.

Milestone: Provide 18 classes annually

#### PROJECT BUDGET:

Project Funding Activity	319 (h) Amount
1 Environmental Specialist	\$45,000
Fringe Benefits (69.94%)	\$31,473
Indirect (46.99%)	\$35,935
Expense (Supplies)	\$500
Expense (printing)	\$11,500
Travel	\$9,000
<b>Total:</b>	<b>\$133,408</b>



### PROJECT 3

**PROJECT NAME:** Green Industries BMP Training for Professional Landscapers to Reduce Non-point Source Pollution

**PROJECT FUNDING:** \$311,243

**LEAD ORGANIZATION:**

Florida Cooperative Extension Service  
University of Florida  
Institute of Food and Agricultural Sciences

**CONTACT:**

Esengul Momol, Director  
Florida-Friendly Landscaping™ Program  
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**PROJECT ABSTRACT:** The Green Industries Best Management Practices (BMP) for Protection of Water Resources in Florida Training program was developed to provide Green Industry professionals with the knowledge, tools and skills to minimize the environmental impacts of non-point sources of pollution related to their business practices. This program is currently delivered statewide by the University of Florida's Institute for Food and Agricultural Sciences (IFAS) and is based on partnerships between Landscape and Green Industry businesses, local municipalities, scientists and homeowners. Regional coordination takes place through the UF-IFAS Extension offices across the state. The Green Industries Best Management Practices (GI-BMPs) program grew out of the industry's desire to establish uniform professional standards of environmental responsibility. The GI-BMP program is a science-based educational program for Green Industry workers (lawn-care and landscape maintenance professionals) in order to teach environmentally safe landscaping practices that help conserve and protect Florida's ground and surface waters. The BMPs recommended by the program can save the service provider and the Florida homeowner money, time, and effort; increase the beauty of the home landscape; and protect the health of families, pets, and the environment.

**PROJECT OBJECTIVE(S):**

The goals of the program include:

- Deliver effective BMP training throughout the state;
- Provide enough of these high quality BMP training opportunities in convenient locations to meet local ordinances and state statutory requirements relating to BMPs;
- Provide train-the-trainer courses in order to allow the BMP training to be offered more frequently and consistently in other communities across the state;
- Support landscape businesses in meeting statutory requirements without undue burden, including tracking and reporting;
- Work with local governments to provide guidance in the development of local fertilizer ordinances; and
- Identify opportunities to partner with participating landscape companies and municipalities to educate homeowners, homeowner associations, garden centers and other related entities to minimize non-point source pollution and reinforce BMPs community-wide.

**PROJECT DESCRIPTION:** This project will provide funding to support Green Industries BMP Training Coordinators at three locations, to cover the entire state. These coordinators will carry out several functions. First, they will deliver/assist with delivering Green Industry BMP classes (in English and Spanish) throughout their respective regions. Second, they will conduct Train-the-Trainer classes to increase the number of approved trainers for this program throughout the state. Third, they will provide oversight of trainers to ensure consistency and quality of the training program and work to educate the industry and communities on the importance of fertilizer and landscape management.

**TASK: Education, Training and Outreach**

The three GI-BMP coordinators will carry out the following activities:

- Create, produce, order, and distribute materials relating to the Green Industries BMP Training Program including workshop announcements, web postings, letters, decals, certification materials and other training materials as necessary.
- Conduct in-person trainings, including registration, tracking, attendance, materials, certification, and evaluation.
- Conduct online and DVD trainings, including registration, tracking, materials, certification, and evaluation.
- Identify, train and monitor a team of trainers in Florida with emphasis on those who speak Spanish and English.
- Conduct pre- and post-training surveys to measure behavior change and quantification of variations in non-point sources of pollution as a result of this program.
- Identify future funding partnerships.
- Meet regularly with program partners to accomplish project objectives and to constantly evaluate the program needs.
- Provide additional statewide support, as needed, to the GI-BMP program.

**PROJECT BUDGET:** The grant will fund three positions along with the associated costs, such as expenses, supplies and travel, required to carry out the activities described in the above task.

GIBMP 319 Categories	Grant
Program	\$211,645.00
Watershed	\$99,597.76
Total	\$311,243.00

**Commented [BK6]:** Added a small budget table. See comments.

**PROJECT GOALS:**

<b>Goal:</b> Educate the public and industry through outreach and training.
<b>(a) Action:</b> Increase the use and understanding of Florida-friendly Landscaping™ (FFL) principles.
<b>(b) Action:</b> Educate green industry professionals about BMPs.

## PROJECT 4

**PROJECT NAME:** Bioassessment Development and Quality Assurance

**PROJECT FUNDING REQUEST:** \$260,282      **MATCH COMMITMENT:** \$ 129,256

**PROJECT COST:** \$389,538

**LEAD ORGANIZATION:** Florida Department of Environmental Protection, Aquatic Ecology QA Section

**CONTACT INFORMATION:**

Name: Nijole (Nia) Wellendorf  
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**Geographic Location (city and county):** Statewide

**PROJECT OVERVIEW:**

The Florida Department of Environmental Protection (department) has a mature bioassessment program that has developed biological monitoring tools and associated quality assurance (QA) for more than 25 years. The department currently uses the Stream Condition Index (SCI), Habitat Assessment (HA), Lake Vegetation Index (LVI), Rapid Periphyton Survey (RPS), and Linear Vegetation Survey (LVS) to determine biological impairment due to nonpoint source pollution of nutrients, sediment, metals, and other pollutants. These biological assessment methods are included in Florida's Water Quality Standards and Impaired Waters Rules (62-302 and 62-303, Florida Administrative Code), and therefore numerous entities outside of the department are using these methods as well. A rigorous quality assurance component to this program is essential for accurate and scientifically defensible decision-making with bioassessment data. The requested funding would support sampling, quality assurance activities, including accurate metric calculations for external parties, and further tool development for the department's bioassessment activities.

Training is an essential element of the bioassessment program, including field sampling method training for new employees and training for all staff on new tools and approaches to be used in conjunction with bioassessment methods. Some of the requested funds would be used to cover travel costs associated with staff attendance at bioassessment sampling training (as trainers and trainees) and the annual Biocriteria meeting. The Biocriteria meeting also serves as a means of educating other private and public entities throughout the state on use of the department's biological assessment methods.

One of the QA components for the department's SCI, LVI, and LVS assessments is taxonomic verification by subject matter experts outside the department for specimens with unknown identification or those specimens to be included in reference collections. Some of the requested funds would be used to support those external expert taxonomic verifications.

Bioassessment methods are used by the department to determine if the aquatic life designated use is being met in Florida waters, and to identify those waters that have unique or exceptional aquatic life use and may warrant more stringent criteria for protection of that use. Correct calculation of the metrics and final scores of our biological monitoring tools is an essential QA element for an accurate and scientifically defensible application of these tools. The department has a biological database (SBIO 2) that performs

these calculations, and this database has been extensively tested to ensure calculations are conducted correctly. SBIO 2, however, is only for department collected data. External parties who perform these methods do not have a standardized, vetted application they can use that will efficiently, consistently, and accurately perform this work. As a result, calculations are done by hand, or in ad-hoc spreadsheets, methods that are error-prone. This requested funding would develop user-friendly, carefully programmed spreadsheets for calculating biological assessment tool metrics and final scores. This funding is used for the meeting, staff travel for sampling, and bioassessment training.

**PROJECT GOALS:**

<b>Goal:</b> Evaluate waterbodies for NPS pollution through a bioassessment program.
<b>(a) Action:</b> Improve integration of existing bioassessment tools into statewide monitoring and assessment programs as well as water resource programs.
<b>(b) Action:</b> Continue to provide technical support staff to the statewide bioassessment program to both implement and expand sampling programs and manage the flow of statewide data collection, analysis, and reporting to program managers and the public.

Project evaluation elements include number of staff within and outside of the Department who are trained annually on bioassessment sampling methods, number of participants in Biocriteria meetings, and assessment decisions made with the support of bioassessment data.

PROJECT FUNDING and TIMELINE:

Project Funding Activity - Federal	Grant Amount
Plant and Invert Taxonomic Verifications (Contractual, Month 1-12)	\$6,000
Biocriteria Meeting and SOP Trainings (Travel)	\$20,000
Development of bioassessment index and calculator spreadsheets (Contractual, 36 months)	\$50,000
Biological Scientist III	\$36,467
Fringe (69.94%)	\$25,505
Environmental Specialist III	\$41,948
Fringe (69.94%)	\$29,338
Indirect (38.29%)	\$51,024
<b>Total:</b>	<b>\$260,282</b>

Commented [BK7]: Some more details in comments.

Project Funding Activity - Match	Match Amount
1 Environmental Administrator, over the bioassessment Section	\$55,000
Fringe (69.94%)	\$38,467
Indirect (38.29%)	\$35,789
<b>Total:</b>	<b>\$129,256</b>

Total Number of Months for the Project: 36

## PROJECT 5

**PROJECT NAME:** Continued Expansion and Sustainability of The Florida-Friendly Landscaping™ Program to Protect Water Quality From Stormwater Runoff and Nonpoint Source Pollution

**PROJECT FUNDING REQUEST:** \$564,407.28

**Match:** \$376,271.52

**TOTAL PROJECT COST:** \$940,678.80

**LEAD ORGANIZATION:**

Florida Cooperative Extension Service  
University of Florida  
Institute of Food and Agricultural Sciences

**CONTACT information:**

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**FINANCIAL COOPERATING PARTNERS:** University of Florida/IFAS

**OTHER COOPERATING PARTNERS:**

The Florida-Friendly Landscaping™ (FFL) Program has grown to become a cooperative effort involving many organizations including the state's water management districts, utilities, city and county governments, the Suwannee River Partnership, DEP Florida Springs Initiative, Florida Nursery, Growers, and Landscape Association (FNGLA) and many other industry and civic groups, along with other UF/IFAS programs (Program for Resource Efficient Communities-PREC, Florida Master Gardener Program, Integrated Pest Management Florida, and the UF Water Institute).

**PROJECT LOCATION AND WATERSHED CHARACTERISTICS:**

FFL is an educational outreach program that covers the entire State of Florida.

**PROJECT OVERVIEW:**

The goal for this project is to protect Florida's water resources, both surface water and groundwater, by reducing nonpoint source pollution and nutrient leaching from urban landscapes.

The main objectives for this project are:

Educate target audiences who affect urban landscapes on the nine FFL principles.  
Continue to respond to county and public requests for information and materials.  
Provide programmatic/technical support to UF/IFAS Extension Service agents statewide who coordinate FFL activities.

Educate landscaping professionals on best management practices that protect surface and groundwater quality.

The primary goal of the FFL program is to educate Floridians about the relationship between their landscaping choices and the environmental impacts of those choices. Through this education effort FFL seeks to change people's behavior so that they adopt landscape practices that protect Florida's water resources, as well as save time and money. This project continues more than twenty years of partnership between EPA, DEP, and UF/IFAS to support local and regional projects that introduce and increase awareness of FFL principles. The success of the program has led to more demand than ever for statewide oversight and guidance to further the implementation of a fully integrated statewide FFL program with regional flexibility.

The FFL program promotes urban landscape design and landscaping best management practices that reduce contaminant loading to surface and groundwater. The proposed FFL programs will help reinforce the FFL messages throughout the state by complementing current projects throughout Florida. This project will work in conjunction with previously DEP-funded FFL programs and FFL programs funded by other partners (i.e., Tampa Bay Water, utilities and counties).

In 2015, 59 of Florida's 67 counties were active in some aspect of the FFL program, including 48 counties with specifically assigned FFL agents within their UF/IFAS Extension Service offices. FFL efforts by Extension offices are augmented through the Master Gardener program, whose participants advocate for and teach FFL principles during the events that they sponsor or in which they participate. The Master Gardener program is active in 59 of Florida's 67 counties and fields over 4,000 citizen volunteers.

Outreach efforts to audiences beyond homeowners, such as builders and developers, retail gardening centers, and landscape professionals, are continuing to gain momentum. This project will enhance the ability of the statewide office to provide technical and administrative support to county FFL programs, improve web and other distance learning opportunities for residents throughout the state, continue to seek additional funding to expand the number of counties offering the program, and provide updated materials for county programs to distribute to all audiences. It will maintain and strengthen the statewide FYN builder/developer component, to enhance outreach efforts to professionals involved in new construction, which is a key part of influencing major changes in landscape design and maintenance behaviors.

**Description:**

The statewide FFL program consists of two program areas 1) a Florida Yards and Neighborhoods (FYN) Program and 2) a Green Industries Best Management Practices (GI-BMP) Program. Each of these program areas is directed by a program coordinator. The FYN Program consists of the Homeowner, Builder and Developer, Homeowner Associations and other components that were previously separately managed. The GI-BMP program also has an education coordinator and a full time program assistant.

The two program areas are supported by three (3) additional grant funded positions that are under the direction of the statewide FFL program director: (1) an information specialist, (2) a web and information technology coordinator, and (3) a program assistant (classified as part-time OPS). Additional support is provided by cooperating organizations such as the University of Florida Center for Landscape Conservation and Ecology, the UF Program for Resource Efficient Communities (PREC), DEP, several state WMDs, local governments, and industry groups. There will be five (5) full time and two (1) part time positions funded under this Agreement, which will be under the direction of and/or supporting the FFL program director.

The FFL program director (a full time UF/IFAS extension funded position) maintains the integrity and quality of the FFL program statewide. Specific responsibilities are to ensure that all project areas have the educational materials that are necessary to carry out the FFL project, advise and participate in the regional training of coordinators, advisors and volunteers, offer programmatic support wherever and whenever it might be necessary, and help develop regional partnerships with other organizations that have a common interest in the well-being of Florida's environment and water quality that could translate into a possible funding relationship for the FFL project.

The FYN program coordinator serves as a liaison between the FFL statewide office and UF/IFAS county agents, FFL coordinators and program assistants, homeowners, and master gardeners. This position also works with FFL coordinators at Extension offices throughout the state to conduct programs to teach FFL principles to builders, developers, property owner association boards, and related audiences (e.g., landscape architects, planners, engineers, realtors) and to provide information on marketing FFL. The position also assists in recruiting, training and coordinating activities of FFL coordinators working with the above audiences.

The GI-BMP Program state coordinator serves as a liaison between UF/IFAS FFL Green Industries Program and county Extension agents, FDEP program management staff and regional coordinators, FDACS, WMDs and local governments, industry stakeholders and the public.

The GI-BMP education coordinator assists the GI-BMP state coordinator to schedule training sessions statewide and respond to phone and e-mail inquiries regarding GI-BMP training. Communicates regularly with Extension and DEP training coordinators and individual trainers through group and individual emails or other means as necessary to provide reminders of educational opportunities, trainer expiration dates, and training updates and changes. Ensures all trainers have adequate up-to-date materials for scheduled classes. Works with faculty to assure program quality is maintained. Grades tests, records scores in database and disseminates score results as needed, checks data and corrects errors, scans OMR tests and uploads data, prints and mails training certificates, exports/formats data records, maintains instructor certification records in Excel.

The GI-BMP program assistant works at the direction of the GI BMP education coordinator and state coordinator to enter student records and surveys into the project database or online forms, score tests (manually, using answer key), distribute files to training providers, compile quarterly training statistics in Excel, respond to phone and email requests, assist with administrative paperwork and filing, and otherwise assisting the GI-BMP program coordinator and FFL director as needed.

The FFL program assistant assists the FFL coordinators with all fiscal transactions and assists the county programs in hiring FFL staff, purchasing equipment, and keeping accounting records of operating expenses. The FFL program assistant also acts as a liaison between the fiscal entities of UF/IFAS (i.e., purchasing, payroll, personnel, travel, and accounting offices), the District Extension Directors' Office, and the individual county accounting staff.

The web and information technology coordinator helps to develop and maintain a central FFL web site, create multimedia features for web use, assists in the implementation and training of FFL coordinators and staff in the use of web-based applications and works on developing online modules for the GI-BMP program.

The information specialist assists in the development, distribution, training, marketing and revision of educational materials (existing and new) for all program areas under the direction of the FFL program director.



All listed positions work in consultation/cooperation with county FFL coordinators, commercial horticulture agents, UF's PREC and the Center for Landscape Conservation and Ecology to maximize efficiency, minimize redundancy and help create a single voice for UF's multi-faceted FFL programming efforts.

#### Effectiveness:

Appropriate use of fertilizers, pesticides and irrigation water by program participants will be measured by surveys conducted before FYN programs and six (6) months to one year afterwards. UF/IFAS Extension faculty and the FFL team are working to develop standardized evaluation tools and protocols. Load reductions within the Total Maximum Daily Load (TMDL) Basin Management Action Plan (BMAP) process resulting from FFL education/outreach efforts will also be inventoried and tallied.

#### PROJECT BUDGET TABLE (319 and Match Funding)

Please total all of the categories in each task above and provide the totals in the table below.

**Commented [BK8]:** Position/ travel details are in comments. We do not typically add this detail since it is contractual work, not a budget category in the grant.

Category Totals	Grant Funding	Match Funding	Total Funding	Match Source
Salaries Total	\$257,367.24	\$235,902.00	\$493,269.24	
Fringe Benefits Total	\$72,288.92	\$58,635.07	\$130,923.99	
Travel Total	\$36,000.00	\$0	\$36,000.00	
Equipment Purchases Total	\$26,000.00	\$0	\$26,000.00	
Supplies/Other Expenses Total	\$121,441.36	\$0	\$121,441.36	
Subtotal	\$513,097.52	\$294,537.06	\$807,634.58	
Indirect Total	\$51,309.75	\$57,734.45	\$109,044.20	
Unrecovered Indirect Total	\$0	\$24,000.00	\$24,000.00	
Total:	\$564,407	\$376,271	\$940,678.79	
Total Project Cost:	\$940,678.79			
Percentage Match:	60%	40%		

FFL 319 Categories	Grant	Match
Program	\$378,152.88	\$252,101.92
Watershed	\$186,254.40	\$124,169.60
Total	\$564,407.28	\$376,271.52

## PROJECT 6

**PROJECT NAME:** Willoughby Creek, Martin County

**PROJECT FUNDING REQUEST:** \$ 475,200 **MATCH COMMITMENT:** \$ 352,000

**TOTAL PROJECT COST** \$ 827,200

**LEAD ORGANIZATION:** Martin County Board of County Commissioners

**CONTACT INFORMATION:**

Name: Greg Nolte  
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**FINANCIAL COOPERATING PARTNERS:**

Martin County Board of County Commissioners – Deborah Drum ([ddrum@martin.fl.us](mailto:ddrum@martin.fl.us))  
St. Lucie Rivers Issues Team (SLRIT), [future] – Kathy LaMartina, SFWMD, (772) 221-4060

**PROJECT LOCATION AND WATERSHED CHARACTERISTICS:**

**Geographic Location, City and County:** Stuart, Martin County, Florida

**Size of Project Impact (area needed to build project):** ~ 10.3 acres

**Size of Area Being Treated:** ~ 385 acres

**Latitude (decimal degrees):** N 27° 10.400'

**Longitude (decimal degrees):** W 80° 13.275'

**Name of Impaired Waterbody Affected:** St. Lucie River and Estuary Basin

**Waterbody ID of Impaired Waterbody Affected (WBID):** WBID 3208

**TMDL Status and Name (if applicable):** Adopted, St. Lucie – Loxahatchee Basin

**TMDL Impairment:** Nutrients and Dissolved Oxygen

**Impairments To Be Addressed by Project:** Nitrogen, Phosphorus and Dissolved Oxygen

Martin County has identified the Willoughby Creek Stormwater Quality Improvement Project as a second priority project within the County's Stormwater Needs Assessment report. The Stormwater Needs Assessment (SNA) reports identifies potential future water quality projects and estimates load reductions for each project in order to guide the County in the decision-making process to meet the TMDL / BMAP requirements. The project is listed as a second priority project simply because it lies within the South Coastal sub-basin, which is outside the current BMAP boundary. However, existing and proposed projects within the South Coastal sub-basin will be considered for credit in the next BMAP iteration, and will be shown as a first priority project in the SNA. Once funded, the Willoughby Creek Stormwater Quality Improvement Project will be listed in the next subsequent update of the Progress Report for the St. Lucie River Estuary BMAP, as it will achieve load reductions for parameters of concern specified in the BMAP.

#### LAND USE and STATUS:

##### Land Uses of the Area Being Treated

The area being treated is the area that is contributing runoff to the treatment system.

- = Empty cell/information to be inserted

<b>Land Use</b> <i>(Do not alter – All must be filled out; do not add categories; place a 0 for no acres)</i>	<b>Acres</b>	<b>%</b>
Residential Medium Density (1200)	1.6	0.4
Residential High Density (1300)	25.0	6.5
Commercial and Services (1400)	72.0	18.7
Industrial (1500)	96.7	25.1
Institutional (1700)	15.1	3.9
Open Land (1900)	7.7	2.0
Upland Forests (4000)	18.1	4.7
Water (5000)	0.9	0.2
Wetlands (6000)	1.2	0.3
Transportation, Communication, and Utilities (8000)	146.3	38.0
<b>Land Use Totals (Acreage and %)</b>	<b>384.6</b>	<b>100%</b>

## PROJECT OVERVIEW:

The project is located within the Hanson Grant area, and Section 11, Township 38 South, Range 41 East, in Stuart, east central Martin County, Florida. Please refer to Attachment No. 1: Vicinity Map. The watershed served by this project is approximately 385-acres consisting primarily of medium- to high-density commercial and industrial properties, the Martin County Fairgrounds, golf course facilities, the Martin County Field Operations Complex, and a portion of Witham Airport. More specifically, the project site is located north of SE Indian Street, east of SE Dixie Highway, south of Witham Airport and west of SE St. Lucie Boulevard. Please refer to Attachment No. 2: Willoughby Creek Existing Basin Boundary and Water Quality Deficient Areas Map.

The Willoughby Creek Basin, upstream of the proposed project, is comprised of highly impervious land uses, including commercial and industrial properties along US Highway 1, the B&A Industrial Park and Flea Market, Old Dixie Highway, a portion Witham Airport and the Martin County Field Operations Complex. Please refer to Attachment No. 3: Land Use Map. Most all of the basin upstream of the proposed project was developed prior to today's design standards for water quality treatment and has been identified as a major contributor of high concentrations of total nitrogen, total phosphorus, total suspended solids and copper by more than 10-years of water quality monitoring by the South Florida Water Management District (SFWMD).

The project proposes to construct an approximately 8-acre combination deep, wet detention lake and shallow treatment wetland. The treatment wetland will be configured in a treatment train system, planted with native herbaceous upland and aquatic plants. The purpose of the treatment train system is to reduce the velocities, and maximize storage capacity, attenuation and residence time in order to achieve the most possible pollutant load reductions within the deep, wet detention lakes, for physical settling of the suspended solids. Further polishing of the stormwater through the biological uptake of nutrients by the vegetation planted in the treatment wetlands will provide additional water quality treatment. The project will be designed to provide ground water recharge and improve timing of fresh water discharges to the St. Lucie Estuary. Please refer to Attachment No. 4: Proposed Project Conceptual Design and Attachment No. 5: Aerial.

Section 319 grant funds and the associated matching funds will facilitate the construction activities such as site clearing, grubbing, excavation, embankment, grading, sodding, planting of trees and native wetland plants. Pipes, control structures, weirs or any other items that would be considered point source structures would not be included in the Section 319 grant or match, but funded through other means.

Additionally, a significant educational component is proposed for this project using a minimum of three educational signs on an educational trail and a kiosk with signage. Martin County will utilize social media and our Martin County Television (MCTV), to the extent possible, to share information with residents regarding our efforts to maximize treatment efficiency within the watershed to achieve water quality results. County staff will participate in a community event to provide educational information regarding stormwater runoff, which will include a specific display associated with this project.

The County proposes a water quality monitoring program that will develop a complete hydrologic budget, based on continuous flow-weighted composite sampling for a minimum of one year. Please see below, "Section 3 Effectiveness", for a more detailed description of the water quality-monitoring program proposed. Section 319 grant funds will be utilized for the monitoring program.

The primary objective of this project is to treat non-point source runoff and provide water quality benefits by reducing the nutrient loads of Total Nitrogen (TN) by an estimated 36.7%, Total Phosphorus (TP) by

65.1% and Total Suspended Solids to the St Lucie River and Estuary, a nutrient impaired water body with an adopted TMDL and BMAP.

The project will be designed and configured in a treatment train system, alternating with deep, wet detention lakes and shallow water, treatment wetlands, which will be planted with native herbaceous upland and aquatic plants. To achieve the objective of the project, storage capacity and attenuation will be maximized in order to increase the residence time within the project, to achieve the most possible pollutant load reductions. Further polishing of the stormwater through the biological uptake of nutrients by the vegetation planted in the treatment wetlands will provide additional water quality treatment. The project will be designed to provide ground water recharge and improve timing of fresh water discharges to the St. Lucie Estuary.

Other objectives of the project are to:

- ✓ implement an educational program that will explain the environmental impacts of stormwater and highlight the benefits of this project to improve water quality in the St. Lucie River, and educate the public of the TMDL program;
- ✓ to implement a water quality monitoring program that will provide data analysis on the pollutant removal efficiency of the BMPs;
- ✓ increase the survivability of oysters and sea grasses within the South St. Lucie Estuary and South Indian River Lagoon, by means of reducing fresh water flows.

**Effectiveness:**

The County proposes a water quality monitoring program that will develop a complete hydrologic budget, comprising of rainfall, evaporation, ground water inputs and losses, flow metering, and continuous flow-weighted composite sampling for a minimum of one year. The monitoring program will be developed to evaluate the performance efficiency of each BMP of the project. A Quality Assurance Project Plan (QAPP) will be prepared in cooperation with the FDEP. The monitoring plan will specify the sampling locations by GPS, sampling instruments, and parameters to be sampled. The parameters shall include, but are not limited to: TN (lbs/yr), TP (lbs/yr), TSS (lbs/yr), NO<sub>2</sub>/NO<sub>3</sub>, TKN, NH<sub>3</sub>, Orthophosphate, fecal coliform, rainfall and flow. The monitoring shall include a sampling location upstream and downstream of each wet detention lake and each treatment wetland in order to evaluate the effectiveness of the treatment train. A Water Quality Monitoring Final Report will be prepared and submitted for review and acceptance by FDEP. The Water Quality Final Report will include an explanation of the system design, field and laboratory activities, results and an overall summary. The report will include characteristics of the monitored inputs and outputs, the performance and mass removal efficiencies and pollutant removal costs.

The project is an all-inclusive project proposed to be constructed in one phase. The construction of the project will be funded through multiple grants, with each grant financing different aspects of the construction of the project. This Section 319 grant and matching funds, will finance a portion of construction including: clearing, grubbing, excavation, embankment, grading sodding, and planting of trees and native wetland plants. The remaining portions of construction will be financed through other grants and local matching funds. The total estimated project cost is \$1,873,000.

The County is currently moving forward with survey, design, engineering and permitting, funding these tasks with local Stormwater MSTU funds.

A FY16/17 St. Lucie River Issues Team (SLRIT) grant, in the amount of \$418,000, has been applied for and is ranked first for funding. State Legislative appropriations for FY17 did not include funding for the St. Lucie River Issues Team, however, the project will be submitted for consideration again through the Issues Team for FY18 funding. Martin County local funds of \$320,000, will be used as match for this Section 319 grant.

Project Funding and Timeline for Only the Grant and Committed Match Funded Portions

Description	Grant Funding	Match Funding	Number of Months To Complete Task
BMP Construction	\$445,200	\$267,000	Month 3 to Month 18
Education	\$0	\$5,000	Month 1 to Month 36
Monitoring	\$30,000	\$70,000	Month 18 to Month 33
Reporting	\$0	\$10,000	Month 1 to Month 36
Totals	\$475,200	\$352,000	

Total Number of Months for the Project: 36 Months

This project will be designed similar to the County's Tropical Farms Stormwater Retrofit Project in which residence time was determined in the Performance Efficiency Evaluation of the Tropical Farms Retrofit Project, Final Report to be 38.9 days. The Summary of the report stated that, "Overall, the Tropical Farms treatment system removed approximately 54% of the total nitrogen, 93% of the total phosphorus, 98% of the TSS, and 70% of the Biological Oxygen Demand (BOD) inputs. These removal efficiencies are substantially greater than removal efficiencies normally associated with wet detention systems, and appear to be related to the unique design of the meandering pond system as well as the presence of the extensive aquatic vegetation."

#### ESTIMATED POLLUTANT LOAD REDUCTIONS

The model used to determine the load reductions was the Basin Management Action Plan (BMAP) for the Implementation of Total Maximum Daily Loads for Nutrients and Dissolved Oxygen by the Florida Department of Environmental Protection in the St. Lucie River and Estuary Basin. The estimated load reductions for this project are 36.7% (746 lbs/yr) for Total Nitrogen and 65.1% (256 lbs/yr) for Total Phosphorus. Please see Attachment No. 9: Martin County BMAP Project Credit List.

#### Pollutant Load Reductions

BMPs Installed	TP lbs/yr	TN lbs/yr
Pre-Project	393	2,034
Post-Project	137	1,288
Load Reduction	256	746
% Reduction	65.1%	36.7%

#### BMP #1 – Additional EMCs

Land Use	TP	TN
Medium-Density Residential (1200)	0.213	1.24
High-Density Residential (1300)	0.339	1.39
Commercial and Services (1400)	0.117	0.71
Light Industrial (1500)	0.225	1.44

Land Use	TP	TN
Institutional (1700)	0.125	0.97
Open Land (1900)	0.036	0.69
Upland Forest (4000)	0.036	0.69
Water (5000)	0.068	0.51
Wetland (6000)	0.033	0.61
Transportation (8000)	0.143	0.99

#### ADDITIONAL INFORMATION

Does the applicant or partner providing at least 10% match have a dedicated stormwater utility fee or other recurring dedicated fee?

a. ☒ Yes ☐ No If yes, state the monthly fee:

Martin County will provide at least a 10% match. Martin County does not have a stormwater utility, however, stormwater fees are collected through an MSTU with a current millage rate of 0.5921 per \$1,000 of the resident's taxable home values. On an average the neighborhood taxable home values are approximately \$114,500, which equates to a MSTU stormwater tax of \$5.65 per month.

Another potential source of revenue for this project is the St. Lucie River Issues Team (SLRIT). The SLRIT was formed in 1998 by the South Florida Ecosystem Restoration Working Group. The mission of the SLRIT is to restore and protect the environmental and aesthetic values of the St. Lucie River and Estuary. It is a legislatively funded grant program supported by 17 local governments, agencies and stakeholder groups. The goal is to identify issues, prioritize and fund "turn dirt" projects that provide immediate results toward improving water quality or ecosystem functions in the St. Lucie River and Estuary. The team ensures that legislative dollars are leveraged with local dollars to implement the projects.

Associated Task #	Type of Structure (pond, swale, etc.)	Estimated Residence Time (in days)
1	Wet Pond / Wetland Detention	~23 days

Based on the Removal Efficiencies of Total Nitrogen and Total Phosphorus in Wet Detention Ponds as a Function of Residence Time<sup>1</sup>, the proposed project will have an estimated 43 acre-feet of permanent pool volume, which equates to approximately 23 days of residence time. Please see Attachment No. 7: Wet Detention Hydraulic Residence Time Graphs.

Does the project utilize innovative technologies/BMPs? For example, stormwater projects that include an extensive treatment train such as a combination of retention ponds, exfiltration trenches, swales, etc., will be considered more innovative than projects that install a single BMP.

☒ Yes ☐ No If yes, please explain how the BMPs are innovative.

The project proposes the use of a deep, wet detention ponds in conjunction with a shallow, meandering wetland detention areas, designed in a treatment train system. The deep, wet detention pond will provide physical treatment by reducing velocities, adding residence time and allowing particles time to settle. The wetland detention will be planted with native, herbaceous, upland and aquatic plants to provide biological treatment through nutrient uptake by the plants. Additionally, a water quality weir and water control structure will be installed to reduce velocities, increase residence time and control discharges to the St. Lucie River.

Is the project located in or does it benefit any of the following areas (check all that apply):

- b. ☐ At least 51% of the project's benefit is received by a special designation area, including Empowerment Zone, Enterprise Community, Champion Community, Area of Critical State Concern, HUD-designated Renewal Community Rural Area of Critical Economic Concern, Rural Economic Development Initiative (REDI) community, Florida Enterprise Zone, or Front Porch Community. If yes, which one(s)?
- c. ☐ At least 51% of the project's benefit is received by an area with median income at 50% or less of the area's median income.
- d. ☒ At least 51% of the project's benefit is received by an area with median income between 80% and 50.1% of the area's median income.

Per the United States Census Bureau web site, the median household income for Stuart, Florida is \$35,540 (2009-2013). The range of median income of 50.1% to 80% is \$17,806 to \$28,432. At least 51% of the project's benefit is received by an area within this range of median income.

This project is in a primarily commercial, light industrial area that includes the local airport, as can be seen in the Land Use table, whereas, only 26.6 acres, or 6.9% of the contributing upstream basin is residential. The County would ask that this project be scored on its merits for addressing a highly impervious basin with known high levels of pollutant concentrations, rather than penalizing it's score for not being in a certain socio-economic income area.

A FY16/17 St. Lucie River Issues Team grant application was submitted in August 2015 and has ranked as the number one project for funding, in the amount of \$418,000, allocated for the construction phase of the project. However, State Legislative appropriations for FY17 did not include funding for the St. Lucie River Issues Team. The project ranking list has been provided to the Indian River Lagoon National Estuary Program (IRL-NEP) for possible funding.

A FY18 St. Lucie River Issues Team grant application is being considered for submittal in August 2016, in the amount of \$418,000 and the funds would be applied to construction.

A FDEP TMDL Water Quality Restoration Grant in the amount of \$330,000 will be applied for at the appropriate time, and the funds would be allocated for the construction of the project.



## PROJECT 7

**PROJECT NAME:** McCarty Ranch Water Farming

**PROJECT TYPE** (Check One): ☐ Urban ☒ Agricultural ☐ Education Only ☐ OSTDS  
☐ Other (describe)

**PROJECT FUNDING REQUEST:** \$642,301.08 **MATCH COMMITMENT:** \$455,670

**PROJECT COST (Sum of Funding Request and Match Commitment):** \$1,097,971.08

**LEAD ORGANIZATION:** City of Port St. Lucie, Utility Systems Department

### CONTACT INFORMATION:

**NAME:** John Eason, P.E.

**Street Address:** 121 SW Port St. Lucie Blvd., Bldg. B

**City, State, Zip Code:** Port St. Lucie, FL 34984

**Tel:** 772-873-6487

**Fax:** 772-871-7615

**Email:** jeason@cityofpsl.com

**FINANCIAL COOPERATING PARTNERS:** City of Port St. Lucie

### PROJECT LOCATION AND WATERSHED CHARACTERISTICS:

**Geographic Location, St. Lucie County (include street address if available):**

12525 Range Line Road, St. Lucie County

**Size of Project Impact (area needed to build project):** 206 Acres

**Size of Area Being Treated:** Retention basin will be used to treat up to 2 percent of water from the C-23 Canal Basin which has a watershed area of 112,677 acres.

**Latitude (decimal degrees):** 27.2138

**Longitude (decimal degrees):** 80.4931

**Name of Impaired Waterbody Affected:** St. Lucie River and Estuary

**Waterbody ID of Impaired Waterbody Affected (WBID):** 3194. Class 3M Estuary

**TMDL Status and Name (if applicable):** TMDL adopted and approved by EPA: Total Nitrogen, Total Phosphorus, BOD

**TMDL Impairment (indicate the parameters in the TMDL, if applicable):** Total Nitrogen, Total Phosphorus, BOD

**Impairments To Be Addressed by Project:** Total Nitrogen, Total Phosphorus, BOD, Total Suspended Solids

**Does this project fall within the boundaries of a developing or adopted Basin Management Action Plan (BMAP) or within an adopted Reasonable Assurance Plan (RAP).** Check one of the following:

☒ Adopted BMAP ☐ Developing BMAP ☐ Adopted RAP

If any of the above are checked please complete the following:

Enter name of BMAP or RAP: St. Lucie River and Estuary Basin Management Action Plan

This project contributes to pollutant reductions specified in the BMAP or RAP.

☒ Yes ☐ No

**LAND USE and STATUS:****Land Uses of the Area Being Treated**

The area for treatment facilities is located on the McCarty Ranch Extension agricultural area which is adjacent to the C-23 Canal. The C-23 Basin land uses are as follows:

- = Empty cell/information to be inserted

<b>Land Use</b> <i>(Do not alter – All must be filled out; do not add categories; place a 0 for no acres)</i>	<b>Acres</b>	<b>%</b>
Residential Low Density (1100)	1,909	1.69
Residential Medium Density (1200)	304	0.27
Residential High Density (1300)	0	0
Commercial and Services (1400)	9	0.01
Industrial (1500)	48	0.04
Extractive (1600)	412	0.37
Institutional (1700)	662	0.59
Recreational (1800)	255	0.23
Open Land (1900)	10	0.01
Agriculture (2000)	84,160	74.69
Upland Nonforested (3000)	1,604	1.42
Upland Forests (4000)	2,724	2.42
Water (5000)	1,811	1.61
Wetlands (6000)	16,279	14.45
Barren Land (7000)	1,108	0.98
Transportation, Communication, and Utilities (8000)	1,382	1.23
<b>Land Use Totals (Acreage and %)</b>	<b>112,677</b>	<b>100%</b>

**Land Ownership Status: (check one)**

- ☒ Land necessary for the construction of treatment infrastructure has been acquired. Title is held by:  
City of Port St. Lucie
- ☐ Land necessary for the construction of treatment infrastructure is under a legal option to buy (please provide documentation of the option to buy and funding to execute the purchase).
- ☐ Land necessary for the construction of treatment infrastructure is under an easement that allows for construction and access.

**PROJECT OVERVIEW:** Please provide information for each of the five items below; Item 6 is optional. Please be very thorough when completing the information.  
Description of only the grant-funded and match commitment activities:

The objective of this “water farming” project is to improve the water quality of the North Fork of the St. Lucie River by reducing the amount of pollutants occurring in the C-23 Canal. It is anticipated that implementation of this project will lead to a reduction of total nitrogen, total phosphorus, BOD and total suspended solids that originates in the canal from runoff from agricultural and urban areas. The project will include incorporation of Best Management Practices using retention basins / infiltration basins to capture a portion of the flow in the C-23 Canal and remove pollutants in a pond-like structure and infiltrate the stored water directly to the groundwater or returned to the C-23 Canal with emergency overflow outlets during extreme rain events.

This project is the first of six or more phases which will be constructed on a fallow citrus grove and other areas of McCarty Ranch. Phase 1 consists of approximately 206 acre site that will divert flow from the C-23 Canal by pumping with two 8,000 gallons per minute pumps into a shallow 4-foot water-depth retention basin constructed with above-ground berms and a static volume of 824 acre-feet. Upon completion of Phase 1 it is projected that more than 2,124 acre-feet of water could be stored or “farmed” annually. Ultimately, when all six phases of the project have been constructed it is estimated that there could be a total treatment capacity of 11,768 acre-feet annually of water pumped from the C-23 Canal.

To promote public awareness of this project and its contribution to improving water quality in the St. Lucie River and Estuary, information will be presented at public meetings and released to news agencies, environmental groups and state and federal governmental members. It is the intention that these discussions will educate the public about the environmental problems and generate support for further projects to be implemented.

Monitoring and reporting the data for total nitrogen, total phosphorus, BOD and total suspended solids will provide verification of the quantities of pollutants that have been removed.

Further information detailing the implementation of this project is provided in “The City of Port St. Lucie, Assessment of Water Farming on Agricultural Lands, The MilCor Group Inc., January 2015” which is attached.

**Objective:**

The objective of this project is to improve the water quality of the North Fork of the St. Lucie River by reducing the total nitrogen, total phosphorus, BOD and total suspended solids in the C-23 Canal. This will be accomplished by pumping water from the canal to a 824 acre-foot storage reservoir (retention basin) where it will allow nutrients to be reduced by 50 to 75 percent of their influent values using ground water recharge. During Phase 1 it is estimated that the annual reduction in nutrients could be 1,641 lbs/yr for total phosphorus, 4,297 lbs/yr for total nitrogen, 12,122 lbs/yr for BOD, and 43,291 lbs/yr for total suspended solids. At the final implementation of all the future phases of this water farming project there could be annual reduction in nutrients of up to 9,091 lbs/yr for total phosphorus, 23,810 lbs/yr for total nitrogen, 67,159 lbs/yr for BOD, and 239,855 lbs/yr for total suspended solids.

This water farming project would also contribute to the reduction in flow from the C-23 Canal by impounding the water and providing infiltration to the ground water. Phase 1 of this water farming project could reduce the C-23 discharges by as much as two percent, and at built-out up to 21 percent.

**Effectiveness:**

Monitoring of the total phosphorus, total nitrogen, BOD, and total suspended solids will be done. Sampling will occur in the storage reservoir over time in the basin. Grab samples will be taken periodically and analyzed at the City’s laboratories to determine influent pollutant loads. Pumping records will be kept documenting the amount of water pumped into the reservoir as well as any amount returned to the C-23 Canal. Groundwater monitor wells will provide samples of water migrating back to the C-23 Canal to calculate pollutant effluent loads.

The results of the monitoring data will be evaluated to determine the quantities of nutrients removed and also, the amount of water flow from the C-23 Canal that has been reduced. The specific monitoring protocols in this analysis

include surface water (rainfall, flow, and stage), water quality (TP, TN, BOD, TSS), groundwater, and soil monitoring. Surface water, groundwater, and soil monitoring is assumed to occur monthly and water quality reporting is estimated to occur quarterly. Evidence of compliance with the services agreement and active permits would be compiled into a report and submitted to applicable agencies.

If the grant and match funded project is part of a larger project, describe the overall project. Include the cost of the overall project in this description.

The current project is part of a multi-phase “water farming” project that will also be a potential water supply source for Port St. Lucie in future years. The capital cost per acre for future phases is lower as the only real construction that will be needed is the containment berms and piping connections. The most expensive equipment, the pumps, will be installed in the first phase. As presented in the “Assessment of Water Farming on Agricultural Land” by The MilCor Group, Inc., the overall water farming components of these projects are estimated to cost \$4,434,000 when completed at built-out. The overall project construction components include influent pumps, distribution pumps, reservoirs constructed with berms using material on-site, influent piping, discharge piping, interconnecting piping, reservoir inlet structures, emergency overflow outlets, observation platforms, pump platforms, monitoring stations, and access roads. Phase 2 through 6 in the McCarty Ranch Extension will incorporate additional reservoirs to the water farming system. Beyond that area in the Extension, an additional 698 acres is available for wet storage in the main parcel of McCarty Ranch.

#### Project Funding and Timeline for Only the Grant and Committed Match Funded Portions

In the table below, provide the estimated funding amounts and timeline (in months) for each grant and committed match funded step in the project. Examples of typical descriptions have been provided but can be edited as needed.

Description	Grant Funding	Match Funding	Number of Months To Complete Task
Design, Permitting	N/A (not eligible for grant funds)	\$100,000	Month 1 to Month 4
BMP Construction	\$629,767.08	\$347,314	Month 5 to Month 12
Education	\$1,500	\$1,000	Month 3 to Month 5
Monitoring	\$8,784	\$5,856	Month 12 to Month 30
Reporting	\$2,250	\$1,500	Month 14 to Month 32

Total Number of Months for the Project: 32 months  
(total number of only the grant and committed match portion).

The sum of the grant and match funded steps should equal the amounts provided on Page 1.

#### Additional Information

The St. Lucie River is a significant tributary to the southern extension of the Indian River Lagoon (IRL). As the largest tributary of the IRL, the St. Lucie River has been integrated into the IRL National Estuary Program. The IRL system (including the St. Lucie River Estuary) contains the most diverse estuarine ecology in North America. The North Fork of the St. Lucie River is designated as an Outstanding Florida Water and also, as a state Aquatic Preserve. Several rare fish species that rely on a tidal system with wide salinities for one or more phases of their life cycle are limited to the tributaries of the IRL, such as the St. Lucie River. In recognition of the environmental impacts, the DEP, the SFWMD, and local governmental, scientific, educational, and citizen organizations are working to develop strategies for protecting and restoring water quality and quantity in the St. Lucie River watershed. Implementing this project would contribute to the goals for an improved and healthy St. Lucie River and Estuary.

### Pollutant Load Reductions

#### BMP #1 Name: Retention/Infiltration Basin

BMPs Installed	TSS lbs/yr	TP lbs/yr	TN lbs/yr	Sediment lbs/yr	BOD lbs/yr	Other lbs/yr	Other lbs/yr
EMC*	10.0	0.379	1.489	-	2.8	-	-
Pre-Project	57,722	2,188	8,595	-	16,162	-	-
Post-Project	14,430	547	4,297	-	4,041	-	-
Load Reduction	42,292	1,641	4,298	-	12,121	-	-
% Reduction	75	75	50	-	75	-	-

### ADDITIONAL INFORMATION

Does the applicant or partner providing at least 10% match have a dedicated stormwater utility fee or other recurring dedicated fee?

- e. ☒ Yes ☐ No If yes, state the monthly fee: A non-ad valorem assessment per household is collected annually in the amount of \$153.00 which is equivalent to \$12.75 per month.

What are the estimated residence times of any ponds, swales, etc. Add rows as needed.

- = Empty cell/information to be inserted

Associated Task #	Type of Structure (pond, swale, etc.)	Estimated Residence Time (in days)
1	Retention Pond	100 max

## PROJECT 9

**PROJECT NAME:** FDEP Education Project

**PROJECT FUNDING REQUEST:** \$1,075,000      **MATCH COMMITMENT:** \$716,666.67

**TOTAL PROJECT COST:** \$ 1,791,666.67

**LEAD ORGANIZATION:** FDEP Watershed Restoration Section

**CONTACT INFORMATION:**

NAME: Katie Britt  
Street Address: 3900 Commonwealth Blvd. Rm 432, Douglas Building  
City, State, Zip Code: Tallahassee, FL 32399  
Tel: 850-245-2938  
Email: [Katherine.britt@dep.state.fl.us](mailto:Katherine.britt@dep.state.fl.us)

**LOCATIONS:** All adopted Basin Management Action Plan (BMAP) areas; with priority given to the below BMAP Areas:

- Lake Okeechobee
- Banana River Lagoon
- North Indian River Lagoon
- Central Indian River Lagoon
- Caloosahatchee River and Estuary Basin
- St. Lucie River and Estuary Basin

**Project Overview:**

The Department will be providing funds for nonpoint source education to local governments in the Basin Management Action Plan (BMAP) areas.

The Department will solicit local governments for projects in the adopted BMAPs, then review and select the top projects submitted in a competitive grant review process. Projects will be focused on education and outreach pertaining to the reduction of nonpoint source pollutants in the adopted BMAP areas.

Methods of outreach may include but are not limited to:

- Public Service Announcements
- Development, publication and distribution of BMP manuals
- Training through workshops, field days, and classes
- Creating and providing information through publications such as flyers and notices
- Posting information on local websites
- Coordinating with area schools to provide classroom education and nonpoint curriculum opportunities

Subjects on Nonpoint Source Pollution Education and Outreach may include but are not limited to:

- Preventing nonpoint source pollution
- OSTDS maintenance and pollution prevention
- Low Impact Development projects
- Activities identified in the BMAPs and targeting BMAP issues
- Citizen and Volunteer Monitoring programs

Project Budget:

FDEP Education Project	
Grant Amount	Match Amount
\$1,075,000	\$716,666.67
Total	\$1,791,666.67

Project Effectiveness Monitoring will be incorporated into each project.

A Final Report will be provided summarizing the projects completed and the results of the effectiveness monitoring.

## PROJECT 10

**PROJECT NAME:** Cone Road, Merritt Island

**PROJECT FUNDING REQUEST:** \$ 400,000.00      **MATCH COMMITMENT:** \$ 374,000.00

**PROJECT COST:** \$ 774,000.00

**LEAD ORGANIZATION:** Merritt Island Redevelopment Agency, Brevard County, FL

**CONTACT INFORMATION:**

Name: Lisa Frazier, Executive Director  
Street Address: 2575 N. Courtenay Pkwy, Suite 207  
City, State, Zip Code: Merritt Island, FL 32903  
Tel: #321-454-6610  
Email: Lisa.Frazier@brevardcounty.us

**FINANCIAL COOPERATING PARTNERS:** Brevard County Public Works Dept; and Brevard County Natural Resource Management Department

**PROJECT LOCATION AND WATERSHED CHARACTERISTICS:**

The Banana River Lagoon (BRL) is located between the barrier island communities of Cape Canaveral, Indian Harbour Beach, and Merritt Island, and at its southern end connects to the IRL. The subject Project is located in BRL B subbasin 3044A Newfound Harbor.

**Geographic Location, City and County (include street address if available):**

Cone Road Industrial Park, Merritt Island, Brevard County, FL

**Size of Project Impact (area needed to build project):** 42.65 acres

**Size of Area Being Treated:** 42.65 acres

**Latitude (decimal degrees):** 20.204524

**Longitude (decimal degrees):** -80.413217

**Name of Impaired Waterbody Affected:** Banana River Lagoon

**Waterbody ID of Impaired Waterbody Affected (WBID):** 3044A – Newfound Harbor

**TMDL Status and Name (if applicable):** TMDL Report, NUTRIENT AND DISSOLVED OXYGEN TMDLS FOR THE INDIAN RIVER LAGOON AND BANANA RIVER LAGOON, approved March 2009;

**TMDL Impairment (indicate the parameters in the TMDL, if applicable):** TN/TP

**Impairments To Be Addressed by Project:** TN/TP



**LAND USE and STATUS:**

Land Use <i>(Do not alter – All must be filled out; do not add categories; place a 0 for no acres)</i>	Acres	%
Residential Low Density (1100)	-	-
Residential Medium Density (1200)	-	-
Residential High Density (1300)	-	-
Commercial and Services (1400)	23.80	55.8
Industrial (1500)	-	-
Extractive (1600)	-	-
Institutional (1700)	8.40	19.7
Recreational (1800)	-	-
Open Land (1900)	-	-
Agriculture (2000)	-	-
Upland Non-Forested (3000)	-	-
Upland Forests (4000)	-	-
Water (5000)	-	-
Wetlands (6000)	-	-
Barren Land (7000)	-	-
Transportation, Communication, and Utilities (8000)	10.45	24.5
<b>Land Use Totals (Acreage and %)</b>	<b>42.65</b>	<b>100%</b>

**PROJECT OVERVIEW**

NPS pollution is the leading cause of water pollution in Florida today. Nonpoint sources include stormwater runoff from urban surface areas and agricultural operations, failing septic tanks, and erosion. CWA Section 319 grant funds may be utilized to pay for the private property owners' costs associated with the closure of the septic tank and construction of the sewer lateral connection. The project is located in Merritt Island, an unincorporated area of Brevard County. On March 30, 2016, the Merritt Island Redevelopment Agency (MIRA) Board of Directors approved to make application for the CWA Section 319(h) Grant for Septic Tank Phase Out in relation to the Cone Road Improvement Project in Brevard County.

The Indian River Lagoon Basin, Banana River Lagoon BMAP, "represents a long-term plan to restore deeper water seagrass habitats in the Indian River Lagoon (IRL) Basin through the reduction of watershed loadings of total nitrogen (TN) and total phosphorus (TP) (nutrients). In 2011, an algal superbloom occurred in the Banana River Lagoon (BRL) and North IRL, with a separate bloom affecting part of the Central IRL. A brown algal bloom affected much of the IRL during 2012. The full impact to seagrasses from these blooms will not be known for a number of years, but there are documented losses of seagrasses in the BRL linked to the blooms. Research is under way to understand the causes of these blooms; however, they appear to be due, in part, to legacy loads in the lagoon from past nutrient discharges. Removing the sources of nutrients from the lagoon's watershed will help remediate the legacy load." (IRL/BRL BMAP, 2013)

This phenomenon has recently repeated itself as seen by excessive fish kills in the Lagoon as of March 2016. Since early this year, the lagoon has been subjected to brown tide, an algae species that produces a mucus that can kill oysters, clams and other shellfish, as well as depleting the water's oxygen needed by fish and other marine life to live. Its effects culminated in a massive fish kill that became apparent in the last weeks of March 2016, resulting in thousands of dead fish from more than 30 species. Decades of

pollution from septic tanks, fertilizers, stormwater runoff and other sources are thought to have contributed to the conditions needed for brown tide in the lagoons. The Brevard County Board of County Commissioners has issued Resolution No. 16-035 for the Protection of the Indian River Lagoon in response to the Lagoon's situation.

The Cone Road stormwater pond, ditch, and adjacent wetlands provide a direct connection to the IRL/BRL. Therefore, wading and foraging habitat exists for many protected wading birds including the Woodstork (*Mycteria americana*). Manatee (*Trichechus manatus*) have also been reported to travel up the open ditch from the river to the outfall weir of the stormwater pond. Improvements to the water quality of this system will have a direct impact on the habitat quality of these species.

#### PROJECT DESCRIPTION:

Since it is difficult to separate non-point pollutant loads from Septic system groundwater flow and from Stormwater overland flow, it is proposed to address both pollutant load reductions as part of the entire Cone Road Infrastructure Improvement project. As part of the CWA 319 Grant and Match funding, increased water quality treatment will consist of the abandonment of 55 septic tanks and lateral connection to the central sewer system and construction of a stormwater treatment train as part of the piping of the Cone Road ditch.

##### Septic Tank Reduction Project

The Cone Road Industrial Park Septic Tank Phase Out Project (Project) proposes to eliminate 55 existing septic tank and drain field systems, and construct the sewer laterals to connect 64 commercial parcels to the Brevard County Utilities Department public sewer system. The public sewer system construction is not a part of the grant and match funded project. The subject area to be served by the system includes 49 existing commercial/industrial parcels (some with multiple buildings), together with six (6) single family residential parcels. Nine (9) other parcels are currently vacant but available for commercial/industrial use. In addition, the Project conditions include:

- A large majority of the existing buildings (and therefore septic tank systems) were constructed between 1950 and 1985.
- The total building square footage of the existing structures is 310,550 sf.
- The total project impact area is 42.65 acres, including 10.45 acres of existing public right-of-way.
- The typical lot size for individual parcels is around 0.5-1.0 acres.
- Most of the facilities were constructed without centralized stormwater treatment, and there are very few stormwater treatment facilities within the project area.

The industrial area south of Cone road was originally platted as a single family residential subdivision with lot dimensions of 50 feet wide and 150 feet deep (roughly 1.5 units/acre). While most of these lots have been combined to accommodate their current uses, the properties are still relatively small considering the heavy industrial nature of the uses. As a result, the congestion and visual blight throughout this area is well established and difficult to remedy. While many of the commercial properties are well-kept and well-maintained, others are in varying stages of disrepair.

##### Stormwater Project

Currently stormwater and groundwater flow into the Cone Road ditch which receives little treatment prior to flowing out to the BRL to the east. The proposed treatment train improvements will include:

- existing undersized piping replacement with a bio swale to divert stormwater flows to the underutilized Brevard County stormwater pond;

- retrofit of the existing outfall ditch to include a denitrification bioreactor;
- an education and monitoring program.

#### **Objective:**

Nitrate is a commonly identified groundwater and surface-water pollutant; it poses serious threats to human health and the environment. One important source of nitrate in the environment is due to wastewater treatment using Onsite Sewage Treatment and Disposal Systems (OSTDS) (a.k.a., septic systems). To facilitate water resources and environmental management (e.g., the calculation of total maximum daily loads, TMDL), nitrate due to septic systems is believed to be one of the reasons of nutrient enrichment.

In accordance with the University of Florida publication “Onsite Sewage Treatment and disposal Systems: Nitrogen” (2011), characterizing the behavior and transport of nitrogen (N) in (septic systems) is important because N present in wastewater can result in groundwater and surface water pollution. Therefore, this Project as proposed addresses both parameters by the removal of septic systems and installation of innovative surface water treatment BMPs.

**Septic Phase Out** Studies show that groundwater plumes contaminated by septic waste may not contain high concentrations of N within 75 feet from the source due to natural denitrification. However, in Florida where many septic systems are located in coastal areas, the wet season water table is very shallow and the soils lack a confining layer. These conditions allow for rapid transport of contaminants to groundwater. In addition, older septic systems were formally permitted at only 6” above the water table, new systems require 2 feet above the wet season water table. The Project area contains septic systems that were installed between the years 1950 and 1985 so we can assume that these systems, should they still be functioning, would be close, if not imbedded in the water table.

One computer model designed to determine nitrate loading from septic systems is “ArcNLET: Nitrate Load Estimation Toolkit”. The model estimates septic system loads by determining the following site specific functions:

- (1) Topography of the area;
- (2) Surface waterbody data;
- (3) Septic tank location; and
- (4) Any site-specific data related to site hydrogeology such as water table, driller log, and organic content.

Therefore, spreadsheet assumptions were made for the Project based on these parameters of soil, depth to water table, estimated gradient rate of denitrification, and population/uses.

The soils map for the Project area reflects that the existing soils within the subject basin are mainly mapped as Myakka Urban Complex, which is generally considered as a Type C soil with poor permeability. The open water elevations in the Cone Rd. ditch and receiving water body typically range from elev. 0.0 to 1.0 NAVD 1988. The Cone Rd. ditch bottom elevations west of Plumosa St. range from elevation -0.2 to 0.5. Based on the poor soil type, estimated water tables in the area of most of the septic systems would be around 24” to 30” below grade. This would put the water table in the range of elev. 2.0 to 5.0 over the project area. Given the poor soil permeability and the significant estimated hydraulic gradient between the water tables at the septic system locations and the open water elevations in the Cone Rd. ditch, it can reasonably be anticipated that groundwater flow direction is migrating towards the open ditch and carrying nitrogen and other pollutants from the septic systems with it.

The 2011 UF study estimated that one person typically discharges 11.2 grams of total N per day. Therefore, Pre-Project loads utilized the recognized formula presented in the 2011 UF study:

X homes x Y people x 11.2 grams total N per day x 365 days in a year.

**Treatment Train:** As stated, treatment of the groundwater in this area can be accomplished by treatment of the surface water too since the hydraulic gradient for both gravitate towards the Cone Road Ditch and Pond system.

A Total Maximum Daily Load (TMDL) for the region has been developed for Total Nitrogen, Total Phosphorous and Total Suspended Solids. This information is derived from work completed by the Brevard County Natural Resources Management Department (NRMD), FDEP Contract No. S0646. The subject basin in this study is 99.97 acres and Total Nitrogen (TN) is estimated at 17.78 lbs/acre; Total Phosphorous (TP) is estimated at 1.32 lbs/acre; and Total Suspended Solids (TSS) is estimated at 507.16 lbs/acre. The NRMD has monitored and measured pollutant removal efficiencies for this adjacent basin which is very similar to the subject basin. Their actual monitoring data revealed 88% removal of Total Nitrogen, 40% removal of Total Phosphorous, and 16% removal of Total Suspended Solids utilizing similar BMP's as proposed in this Project. It is anticipated that TSS removal will increase to at least 50% over time as the system settles. Based on this data, the load reductions presented can be anticipated for the Project.

**Effectiveness:**

Starting in Month #12, prior to initiation of the septic phase out project, monitoring stations will be established within the Cone Road Stormwater Pond outfall and inlet to establish base parameters of nutrient loading. Continuous monitoring will occur throughout the year after Storm Events (not to exceed six storm events). The goal of storm event monitoring for this project is to determine pollution removal efficiency by comparing pollutant loads entering the project through the inlet and pollutant loads leaving the project through the outlets.

Monitoring for this project will consist of pollutant removal efficiency of the project by comparing pollutant loads at the inflows and outflows of the project via auto sampler/flowmeter systems. Base sampling will begin prior to septic phase out and continue for one (1) year following implementation of the phase out and treatment train. Parameters will include TN/TP/TSS/Fecal Coliform and Turbidity. Event concentrations, loads, and removal rates will be presented. Reports will be delivered to FDEP covering the monitoring period and including the baseline parameters and all storm event results. This area is currently being monitored for all the parameters at the Fortenberry Outfall Canal (DEP contract No. S0646) which lies east of the Cone Road Ditch and flows out to the BRL.

#### Project Funding and Timeline for Only the Grant and Committed Match Funded Portions

In the table below, provide the estimated funding amounts and timeline (in months) for each grant and committed match funded step in the project. Examples of typical descriptions have been provided but can be edited as needed.

Description	Grant Funding	Match Funding	**Number of Months To Complete Task
Design, Permitting	N/A (not eligible for grant funds)	\$80,000	Month 1 to Month 6
BMP Construction	\$300,000	\$264,000	Month 7 to Month 24
Education	\$40,000	\$30,000	Month 1 to Month 24
Monitoring	\$40,000	\$	Month 12 to Month 24
Reporting	\$20,000	\$	Month 12 and Month 24

Month 1 = October 2016; Month 24 = September 2018

Total Number of Months for the Project: 24 Months

#### Grant Funding BMP Construction Costs: \$300,00.00

- Construction of approximately 60 lateral connections from property buildings to Sewer System in Right of Way (run new sewer line to sewer stub outs and install clean outs);
- Abandonment of approximately 55 Septic Tanks (pump-out tanks, break lids and bottoms, fill tanks with clean sand;

#### Grant Funding Education, Monitoring, and Reporting: \$100,000.00.

- Project Education Program: Starting in month #12, following construction of the sewer system, property owners will be notified of their ability to connect to the central sewer system and phase out their individual septic systems. A General Contractor will be selected and individual property owner agreements will be designed to protect the Contractor and MIRA from liability. The agreements will provide for the abandonment of the septic tanks and construction of the plumbing tie-in and laterals from the building to the Right-of-Way. MIRA will administer the program with assistance from a contracted Consultant and provide a continuous public involvement program throughout the project.
- Monitoring Program: Starting in month #12, prior to initiation of the septic phase out project, monitoring stations will be established within the Cone Road Stormwater Pond outfall and inlet to establish base parameters of nutrient loading. Continuous monitoring will occur throughout the year after Storm Events (not to exceed six storm events) with the assistance of a contracted Consultant. The goal of storm event monitoring for this project is to determine pollution removal efficiency by comparing pollutant loads entering the project through the inlet and pollutant loads leaving the project through the outlets.
- Reporting Program: Reports will be delivered to FDEP covering the monitoring period and including the baseline parameters and all storm event results.

#### Match Funding Design and Permitting: \$80,000.00.

Phase II Design and permitting of the 60 septic phase out sites and Cone Road stormwater treatment train BMP's.

Match Funding Education Program: \$30,000.00

Starting in Month #1, following design of the wastewater sewer system, property owners will be notified of their ability to connect to the central sewer system and phase out their individual septic systems. The Public Involvement portion of the program, conducted by a contracted Consultant, will include educational workshops regarding the effects of this project on the water quality of the Lagoon, owner responsibility, and MIRA's efforts in funding this program. In addition, property owners will be able to provide feedback in regard to the design and timing of the project prior to its start. Property owners will be encouraged to indicate on a non-binding form whether they are interested in participating in this program with the assistance of the Grant Funds. At this point in time, approximately 10% of the property owners who are aware of the project indicate that they would like to participate. The majority of the property owners are unaware of the proposed project.

Match Funding BMP Construction Costs: \$264,00.00

Currently stormwater and groundwater flow into the Cone Road ditch, which receives little treatment prior to flowing out to the BRL to the east. The proposed treatment train improvements will include:

- Replacement of existing undersized piping with a bio swale to divert stormwater flows to the underutilized Brevard County stormwater pond;
- Retrofit of the existing outfall ditch to include a denitrification bioreactor;
- Asphalt and Concrete Repairs connected with the Septic Phase out project.

## ESTIMATED POLLUTANT LOAD REDUCTIONS

### BMP #1 Name: Septic Tank Phase Out

BMPs Installed	TP lbs/yr	TN lbs/yr
EMC*	-	-
Pre-Project	276	1979
Post-Project	0	0
Load Reduction	276	1979
% Reduction	100	100

### BMP #2 Name: Stormwater System Treatment Train

BMPs Installed	TSS lbs/yr	TP lbs/yr	TN lbs/yr
EMC*	-	-	-
Pre-Project	50,701	132	1778
Post-Project	25351	53	1565
Load Reduction	25,350	79	213
% Reduction	50	40	88

## ADDITIONAL INFORMATION

Does the applicant or partner providing at least 10% match have a dedicated stormwater utility fee or other recurring dedicated fee?

f. ☒ Yes ☐ No If yes, state the monthly fee:

**\$64/ERU (residential). Commercial is based on impervious area. These dollars are not proposed to be utilized as match for this project.**

Associated Task #	Type of Structure (pond, swale, etc.)	Estimated Residence Time (in days)
BMP#2	Bio Swale	15 – 30 days

Does the project utilize innovative technologies/BMPs? For example, stormwater projects that include an extensive treatment train such as a combination of retention ponds, exfiltration trenches, swales, etc., will be considered more innovative than projects that install a single BMP.

☒ Yes ☐ No If yes, please explain how the BMPs are innovative.

**The proposed development of a bio swale to replace an existing piped system coupled with a denitrification reactor, adds additional elements to the treatment train for this area.**

Is the project located in or does it benefit any of the following areas (check all that apply):

- g. ☐ At least 51% of the project's benefit is received by a special designation area, including Empowerment Zone, Enterprise Community, Champion Community, Area of Critical State Concern, HUD-designated Renewal Community Rural Area of Critical

Economic Concern, Rural Economic Development Initiative (REDI) community, Florida Enterprise Zone, or Front Porch Community. If yes, which one(s)?

- h. ☐ At least 51% of the project's benefit is received by an area with median income at 50% or less of the area's median income.
- i. ☒ At least 51% of the project's benefit is received by an area with median income between 80% and 50.1% of the area's median income.

The Cone Road Industrial Park project area encompasses deteriorating industrial/commercial lands located south of Cone Road and north of the Merritt Island Airport. The area supports many small industrial and service-related businesses. It was not designed as an "industrial park", in that each parcel is a stand-alone development with private access, utilities, stormwater, etc. Compliance with current land development regulations seems to vary from parcel to parcel. In addition, there are several properties which appear to be utilized for residential purposes. Also, there is a parcel of property owned by Brevard County (approximately 5.7 acres) which is being utilized by the Brevard County Public Works Department as the District 2 Operations Center and Storage Area. Immediately to the west of this area are several vacant parcels that contain historic wetland adjacent to the Banana River Lagoon.

The Cone Road Area was originally platted for single family use with small lots that have been converted to commercial storage, warehousing, heavy commercial, and industrial uses. Due to this fact, many of the properties in this area do not meet current land development regulations as mentioned above, nor do they meet the minimum lot area requirements listed in the Brevard County Zoning Code. They are therefore considered non-conforming lots of record. Contemporary development trends favor larger sites for redevelopment as they offer the flexibility to provide a variety of uses and a mix of activities. Larger sites also reduce the complexities involved with assembly of smaller parcels to support large scale redevelopment projects. The age of structures is a potential contributor to the declining conditions and high vacancy rates witnessed in the study area. Aging buildings typically require increased maintenance and repair. The Cone Road Area concentration of older, poorly maintained and dilapidated buildings creates many negative influences in an area including a loss of economic status, a lack of interest in new development, an increased occurrence of crime, and decreased revenues for businesses. GIS data indicates that approximately 58% of the structures are over forty years old. The older structures are generally concentrated on smaller parcels, and are not as well maintained as newer structures and facilities in the area.

According to data available from the Brevard County Property Appraiser, the Study Area showed a 46.4% decline in taxable value from the year 2005 to 2011. In comparison, the County's taxable values decreased by 29.4% during the same period. It should be noted that this time frame has shown a serious economic decline in the real estate market overall. However, the fact that the area's rate of decline is higher than that of the county's overall would indicate that the sub-area is in a more serious decline than the County as a whole.



## PROJECT 11

**PROJECT NAME:** Think About Personal Pollution (TAPP), City of Tallahassee

**PROJECT FUNDING REQUEST:** \$320,000

**MATCH COMMITMENT:** \$620,000

**TOTAL PROJECT COST:** \$940,000

**LEAD ORGANIZATION:** City of Tallahassee

**CONTACT INFORMATION:**

Name: Mark Heidecker

Street Address: 300 S. Adams Street, B-35

City, State, Zip Code: Tallahassee, FL, 32317

Tel: 850-891-6825

Fax: 850-891-6880

Email: Mark.Heidecker@talgov.com

**FINANCIAL COOPERATING PARTNERS:** The City of Tallahassee will be contributing 100% of the match.

**PROJECT LOCATION AND WATERSHED CHARACTERISTICS:**

**Geographic Location, City and County (include street address if available):** City of Tallahassee, Leon County, Florida. The area for the comprehensive outreach campaign is located within the St. Marks and Ochlocknee River Basins as well as the Wakulla Springs Basin.

**Size of Project Impact (area needed to build project):** Regional **Size of Area Being Treated:** Leon County – 457,972 Acres **Latitude (decimal degrees):** 30.439355 N

**Longitude (decimal degrees):** -84.281150 W

**Name of Impaired Waterbody Affected:** Attachment 1

**Waterbody ID of Impaired Waterbody Affected (WBID):** Attachment 1

**TMDL Status and Name (if applicable):** Attachment 2

**TMDL Impairment (indicate the parameters in the TMDL, if applicable):** Attachment 2

**Impairments To Be Addressed by Project:** Nutrients (Nitrogen - Phosphorus) and Bacteria

**LAND USE and STATUS:**

<b>Land Use</b> <i>(Do not alter – All must be filled out; do not add categories; place a 0 for no acres)</i>	<b>Acres</b>	<b>%</b>
Residential Low Density (1100)	33,939	7.41
Residential Medium Density (1200)	26,596	5.81
Residential High Density (1300)	6,538	1.43
Commercial and Services (1400)	6,568	1.44
Industrial (1500)	171	0.04
Extractive (1600)	386	0.08
Institutional (1700)	4,736	1.03
Recreational (1800)	1,939	0.42
Open Land (1900)	623	0.14
Agriculture (2000)	16,182	3.53
Upland Nonforested (3000)	10,552	2.30
Upland Forests (4000)	222,547	48.59
Water (5000)	10,064	2.20
Wetlands (6000)	106,024	23.15
Barren Land (7000)	226	0.05
Transportation, Communication, and Utilities (8000)	10,881	2.38
<b>Land Use Totals (Acreage and %)</b>	<b>457,972</b>	<b>100%</b>

**PROJECT OVERVIEW****Production of Public Service Announcements (PSAs)**

Over the four year period (2017 – 2020) TAPP is requesting \$150,000 in grant funds to produce six public service announcements, targeting the citizens of Leon County, with a focus on the impacts of non-point source pollution. Match will be provided by the City of Tallahassee through advertisement purchases with local television networks, and the purchase of billboards. The billboard messages will be variations of grant funded (current & previous) PSAs.

In the past, these nationally recognized and award winning PSAs, have focused on lawn fertilizer, pet waste, various illicit discharges, car washes and trash. Research conducted has demonstrated that past TAPP PSAs have been successful in behavioral changes with both a reduction in the application of fertilizer and pick-up of pet waste.

PSAs create awareness and understanding of both the source and effect of non-point source (NPS) pollution. The effect of NPS pollution on the local waterways of Leon County can be minimized by educating residents and empowering a change in behavior. TAPP has produced over a dozen PSAs relating to NPS and resulting survey data indicate a dramatic change in behavior. The changes in behavior have resulted in a 10% reduction in the application of fertilizer and a 30% increase in the pick-up and disposal of pet waste. With forty nutrient or bacteria impairments within Leon County, most of the PSAs planned for 2017-2020 will focus heavily on the nonpoint sources of these impairments. It is anticipated that this increased emphasis will continue to reduce the amount of pollutants discharged into our

waterways. The research associated with the PSAs – focus groups & surveys – is essential to develop the proper message and determine the effectiveness of the outreach.

Grant Funding Request: \$150,000, Match – City of Tallahassee: \$445,000

**Research to Guide & Evaluate Public Service Announcement (PSA) Effectiveness Over the four year period (2017 – 2020)** TAPP is requesting \$25,000 in grant funds to guide and evaluate the effectiveness of the PSAs. Focus groups will be established each year, prior to PSA development, to determine the primary PSA message. At the conclusion of each PSA campaign both statistically valid surveys and focus groups will be utilized to determine the overall effectiveness. At the conclusion of the 2020 campaign the City of Tallahassee will evaluate the preceding TAPP research and determine the overall effectiveness of this ongoing campaign. This evaluation will include a compilation of data and provide the City and DEP with a standard measure of effectiveness or behavior change resulting from TAPP.

Grant Funding Request: \$25,000 Match – City of Tallahassee: \$60,000

### **E<sup>3</sup> – Equity in Environmental Education Targeted Outreach**

Over the four year period (2017 – 2020) TAPP is requesting \$20,000 to assist in the development and implementation of a targeted public education plan that will continue to focus on Equity in Environmental Education – E<sup>3</sup>. The pilot E<sup>3</sup> initiative commenced in the previous grant cycle with a heavy focus on increasing community engagement where socio-economic barriers currently exist.

Each year either a TAPP afterschool program or TAPP summer camp will be offered at a local community center in the Lake Munson Drainage Basin, which is the primary focus of E<sup>3</sup>. Match will be provided by the City of Tallahassee through the creation of a TAPP curriculum and by sharing the cost of the afterschool program and summer camps.

The E<sup>3</sup> targeted outreach will create awareness of NPS pollution in areas and segments of the population that are not or have not traditionally been reached. This outreach effort will target areas where socio-economic barriers have been known to exist. TAPP E<sup>3</sup> will work to break down these barriers and change behavior to induce a reduction in NPS pollution, specifically in the Lake Munson Basin where thirteen impaired waters reside.

The development of a TAPP specific curriculum for either after school programs or summer camps will focus on NPS pollution and local water resources. To ensure maximum reach, the afterschool program and/or summer camps will be promoted by an E<sup>3</sup> coordinator.

### **Targeted Public Education Plan to Meet Basin Management Action Plan (BMAP) Requirements**

The Upper Wakulla River & Wakulla Springs Basin BMAP attributes 51% of the current nitrate loading to Onsite Sewage Treatment & Disposal Systems (OSTDS). Section 1.3.4.1 of the BMAP requires the OSTDS initiative to develop a public education plan that at a minimum provides area residents with reliable and understandable information about OSTDS and their effect on Wakulla Springs. The generation of awareness and understanding of OSTDS will lead to change in behavior. Expected changes as a result of the education plan are an increase in both OSTDS upgrades or maintenance activities, and connections to the sanitary sewer system, which will reduce nitrogen loading in the Wakulla Springs basin.

Grant Funding Request: \$20,000 Match – City of Tallahassee: \$25,000

**Development & Implementation of a Targeted Public Education Plan to Meet Basin Management Action Plan (BMAP) Requirements**

Over the four year period (2017 – 2020) TAPP is requesting \$25,000 to assist in the development and implementation of a targeted public education plan as required in the Upper Wakulla River & Wakulla Springs Basin BMAP. Section 1.3.4.1 (Attachment 3) of the BMAP requires the Onsite Sewage Treatment and Disposal Systems (OSTDS) initiative to develop a public education plan that at a minimum provides area residents with reliable and understandable information about OSTDS systems and their effect on Wakulla Springs. This can be accomplished through a variety of outreach methods that may include production and advertisement of PSAs. Match will be provided by the City of Tallahassee.

Grant Funding Request: \$25,000 Match – City of Tallahassee: \$25,000

**Pilot Program to Provide Incentive for Implementation of Low Impact Development (LID) Techniques for both Commercial Development & Redevelopment**

Over the four year period (2017-2020) TAPP is requesting \$225,000 to provide monetary incentive for the inclusion of LID techniques on both commercial development and redevelopment projects. It is anticipated that this pilot program will jump start local developers into incorporating LID techniques into projects within the City of Tallahassee. LID techniques include but are not limited to bioretention, pervious pavement, green roofs, rain gardens, cisterns, vegetated swales and tree wells. Match will be provided by the City of Tallahassee through the development of an implementation manual that will include a final listing of techniques eligible for reimbursement, a structure for reimbursement and a method to estimate load reductions. Additional match, provided by the City of Tallahassee, will be through promotion of the incentive.

Local commercial landuse Event Mean Concentrations (EMCs) in Tallahassee for Total Nitrogen (TN), Total Phosphorus (TP) and Total Suspended Solids (TSS) are 1.05mg/L, 0.22 mg/L and 50.3 mg/L, respectively. Where appropriate space is available, LID can be incorporated into commercial development and redevelopment sites and significant reductions of NPS pollution can be achieved through water storage, filtration, infiltration and reductions in directly connected impervious surfaces. Depending on the LID techniques implemented, reductions in TN, TP and TSS could be as high as 3.0, 14.25 and 682 pounds per year, respectively; for each acre of impervious surface fully treated with LID.

Grant Funding Request: \$100,000 Match – City of Tallahassee: \$65,000

**Effectiveness:**

The success of TAPP will be evaluated in a variety of ways depending on the BMP activity as follows: PSA Campaign – effectiveness will be evaluated by utilizing focus groups and statistically valid surveys to determine change in behavior. At the conclusion of phase 2, success of PSA campaigns will be determined through an analysis of the compilation of data collected since the inception of TAPP. It is anticipated that these data will be used by the City and DEP as a measure of effectiveness going forward.

E<sup>3</sup> – effectiveness of each afterschool program or summer camp will be evaluated through pre/post surveys, enrollment and the engagement level of participants.

OSTDS BMAP Public Education – the public education plan is only a portion of the overall BMAP OSTDS initiative. Development of a plan acceptable to DEP to implement management strategies for the

reduction nutrient loading from OSTDS, of which one of the main objectives is a public education plan, will define success.

Implementation of LID Techniques – success will be evaluated by determining the reduction of nutrient pollution attributed to the implementation of LID techniques on either commercial development of redevelopment projects.

**PROJECT FUNDING AND TIMELINE TABLE:**

<b>Description</b>	<b>Grant Funding</b>	<b>Match Funding</b>	<b>Number of Months To Complete Task</b>
PSA Production – Phase 1	\$50,000	\$165,000	Month 1 to Month 15
PSA Production – Phase 2	\$100,000	\$280,000	Month 16 to Month 39
Research – Phase 1	\$0	\$25,000	Month 1 to Month 15
Research – Phase 2	\$25,000	\$35,000	Month 16 to Month 39
E3 Targeted Outreach – Phase 1	\$10,000	\$15,000	Month 1 to Month 15
E3 Targeted Outreach – Phase 2	\$10,000	\$10,000	Month 16 to Month 39
BMAP OSTDS – Phase 1	\$10,000	\$5,000	Month 1 to Month 15
BMAP OSTDS – Phase 2	\$15,000	\$20,000	Month 16 to Month 39
LID Incentive – Phase 1	\$0	\$55,000	Month 1 to Month 15
LID Incentive – Phase 2	\$100,000	\$10,000	Month 16 to Month 48

Total Number of Months for the Project: 48

## PROJECT 12

**PROJECT NAME:** Island Lake, City of Longwood

**PROJECT FUNDING REQUEST:** \$ 407,070      **MATCH COMMITMENT:** \$ 271,380

**PROJECT COST:** \$ 678,450

**LEAD ORGANIZATION:** City of Longwood

**CONTACT INFORMATION:**

Name: Jon C. Williams  
Street Address: 175 West  
Warren Avenue City, State, Zip:  
Longwood FL 32750  
Tel: 407-260-3445  
Fax: 407-260-3419  
Email: jwilliams@longwoodfl.org

**FINANCIAL COOPERATING PARTNERS:** City of

Longwood **PROJECT LOCATION AND WATERSHED**

**CHARACTERISTICS:**

**Geographic Location (city and county):** City of Longwood; Seminole County Florida

**Size of Project Impact:** 84.8 Acres

**Size of Area Being Treated:** 84.8 Acres

**Latitude (decimal degrees):**

28.68527071 **Longitude (decimal**

**degrees):** -81.36138240

**Name of Impaired Water Body Affected:** Cranes Roost

**Outlet Water Body ID of Impaired Water Body Affected**

**(WBID):** 2998

**TMDL Status and Name:** TMDL Basin Rotation Group 2 Middle St. Johns - State Adopted  
TMDL and EPA Approved

**TMDL Impairment; indicate the parameters in the TMDL:** Nutrients – Chlorophyll-A,  
NO3, TP, DO

**Impairments To Be Addressed by Project:** NO3

**Basin Management Action Plan:** Middle St. Johns Group 2

## LAND USE and STATUS:

### Land Uses of the Area Being Treated

The area being treated is the area that is contributing runoff to the treatment system.

<b>Land Use</b> <i>(Do not alter – All must be filled out; do not add categories; place a 0 for no acres)</i>	<b>Acres</b>	<b>%</b>
Residential Medium Density (1200)	84.8	100
<b>Land Use Totals (Acreage and %)</b>	<b>84.8</b>	<b>100%</b>

## PROJECT OVERVIEW:

The total project proposes to eliminate 100 septic tanks. The overall project includes constructing a central sewer system but that work is not a part of the grant and match funded project. The requested grant and match portion is only for the abandonment of the septic tanks, installation of the individual laterals, repair of the roadway for the lateral connections only and physical connection of the homes to the sewer system (this does not include the hook up fee). This will allow the City to connect 100 existing single family residences in the South Island Lake area, located within close proximity to two lakes with three residences per acre, with an estimated three people living in each home. Most were built in the early to mid1970's. The average size lots in these subdivisions are .26 acre. There also was no centralized retention installed at the time of building these subdivisions. The project includes abandonment of the septic tanks and connection to the City of Longwood sewer system. The project will also include constructing a lift station and force main. The wastewater will be pumped to Seminole County for treatment.

### Project Description:

The total project will involve the preparation of all design and specification drawing for the installation of sewer lines in the area of South of Island Lake near Longwood, the abandonment of all septic tanks (in some cases more than one) The connection of all residential lots to the new sewer main; and all roadway repaired.

### Abandonment of septic tanks and connection to sewer main.

Description: The selected Septic Tank Contractor will abandon septic tanks on site, pump-out septic tanks; break lids and bottoms; fill tanks with clean sand; install cleanouts; and run new sewer line to the sewer connection spot.

The project is located in Seminole County in the boundary limits Island Lake to the North, Stelle Avenue to the East, Marla Avenue to the West and Arden Street to the South. The project will prevent existing septic tank discharges from going into the two adjacent lakes in the area, Island Lake, and Lake Seminole. Lake Seminole drains to the Cranes Roost Outlet which has a WBID of 2998. Cranes Roost Outlet is part of the Wekiva River, Rock Springs Run, Little Wekiva Canal BMAP. This adopted BMAP calls for reductions of NO3, TP and DO. Island Lake drains to the North to Lake Winsor which is within the Soldiers Creek Basin which has a TMDL established for Fecal Coliform. In any event the eventual destination of this water is Lake Jesup WBID 2981.

**Objective:** The removal of the existing septic tanks is expected to reduce significantly the amount of nutrients and fecal coliform being contributed to the water bodies. Based on the formulas presented in the above referenced documents the expected removal of TN will be 3,100 pounds per year, TP will be 500 pounds per year and Fecal Coliform will be 8.2E+9. This will benefit the watershed and achieve reductions of the total TMDL of .3% TP and 1.1% NO3 in the Wekiva River, Rock Springs Run, and Little Wekiva Canal BMAP area.

**Effectiveness:**

This area is currently being monitored for all the parameters at the Cranes Roost Outlet. Monitoring will continue and focus on the validation of the expected results.

**PROJECT FUNDING AND TIMELINE**

Description	Grant Funding	Match Funding	No. of months to complete task
Design, Permitting	N/A (not eligible for grant funds)	\$0	Month 1 to Month 6
BMP Construction	\$407,070	\$271,380	Month 8 to Month 24

Total Number of Months for the Project: 24



### PROJECT 13

**PROJECT NAME:** Best Management Practices for Non-Proprietary Passive Nitrogen Reducing Onsite Sewage Treatment and Disposal Systems

**PROJECT TYPE** (Check all that apply): ☐ Urban ☐ Agricultural ☐ Education Only  
☒ OSTDS ☐ Other (describe)

**PROJECT FUNDING REQUEST:** \$ 60,000 **MATCH COMMITMENT:** \$ 40,000

**TOTAL PROJECT COST (Sum of Funding Request and Match Commitment):** \$ 100,000

**LEAD ORGANIZATION:** Florida Department of Health

**CONTACT INFORMATION:**

**NAME:** XUEQING GAO  
**Street Address:** 4052 Bald Cypress Way, Bin A08  
**City, State, Zip:** Tallahassee, FL 32399-1710  
**Tel:** (850) 245-4579  
**Fax:** (850) 487-0864  
**Email:** Xueqing.Gao@FLHEALTH.gov

**FINANCIAL COOPERATING PARTNERS:** Florida Department of Health

**PROJECT LOCATION AND WATERSHED CHARACTERISTICS:**

**Geographic Location, city and county (include street address if available):**

**Size of Project Impact (area needed to build project):** Statewide

**Size of Area Being Treated:** N/A

**Latitude (decimal degrees):** N/A

**Longitude (decimal degrees):** N/A

**Name of Impaired Water Body Affected:** N/A

**Water Body ID of Impaired Water Body Affected (WBID):** N/A

**TMDL Status and Name, if applicable:** N/A

**TMDL Impairment; indicate the parameters in the TMDL, if applicable:** Nitrogen

**Impairments to be Addressed by Project:**

This project will provide key information and data on the long-term nitrogen removal efficiencies and system performance for a set of non-proprietary passive nitrogen reducing onsite sewage treatment and disposal system (OSTDS) designs through monitoring five passive nitrogen reducing OSTDSs installed in different parts of Florida. Results from this project will facilitate the implementation of these OSTDS designs in Florida to help reduce nitrogen loads to Florida aquifers and restore Outstanding Florida Springs and surface waterbodies across the state that are impaired for nutrients.

**Does this project fall within the boundaries of a developing or adopted Basin Management Action Plan (BMAP) or within an adopted Reasonable Assurance Plan (RAP).** Check one of the following:

☒ Adopted BMAP ☒ Developing BMAP ☒ Adopted RAP

This is a statewide project focused on specific BMAP areas. Results from this project will benefit the nitrogen load reduction required in BMAP basins across the state where OSTDS contribute more than 20% or more of total nonpoint source nitrogen loads entering nutrient impaired Outstanding Florida Springs and other nutrient impaired surface waterbodies where OSTDS nitrogen loads have significant impact, including such BMAP basins as Wakulla, Wekiva, Rainbow and Silver Springs, Crystal River – Kings Bay, Weeki Wachee, etc.

## PROJECT OVERVIEW:

To control the nitrogen loads from OSTDSs into Florida waterways and protect the designated uses of precious water resources in the State, in 2008, the Florida legislature directed the Department of Health (FDOH) to contract with experts to develop cost-effective nitrogen reduction strategies for OSTDS. With the legislative mandate, the Florida Onsite Sewage Nitrogen Reduction Strategies (FOSNRS) project was initiated in January of 2009 and finalized in December of 2015. Through a comprehensive literature review, performance comparison, cost-effective analyses, and technology ranking, Hazen and Sawyer, the consulting firm contracted by FDOH to carry out the project, recommended two-stage passive biofiltration as the most operationally simple, effective, and applicable nitrogen removal technology to control nitrogen loads from OSTDS to Florida waterways (Hazen and Sawyer, 2009).

One of the major studies of the FOSNRS project was the experimental evaluation of onsite wastewater nitrogen reduction technologies at home sites. To test the performance of the technologies under the field conditions, prototype two-stage biofiltration OSTDSs with different designs were constructed, installed, and monitored at seven selected single family residential sites across the State of Florida in the period from June 2011 through February 2015. Bi-monthly water quality sampling on these systems was conducted during the period for about 18 months for each system. During the study, the simplicity of constructing and installing these systems were evaluated; technology details were refined; and maintenance requirements, energy consumption, system performance, and nitrogen removal efficiencies were closely monitored and characterized for these systems. Results from the study indicated that the passive two-stage biofiltration technologies performed effectively under field conditions at these home sites. The majority of these systems achieved an overall total nitrogen (TN) removal rate ranging from 65% to 97%. Maintenance requirements for these systems were low and mostly were for system adjustments needed when these systems were newly constructed and installed. Energy costs were low, about \$3.00 per month, primarily used to drive the single pump used for these systems. Construction costs for these systems ranged between \$10,399 to \$32,115 with an average of \$17,726. Costs for similar systems will likely reduce with more standard designs and widespread implementation. **Table 1** summarizes key information from the FOSNRS onsite system study related to these systems (Hazen and Sawyer, 2015). **Figure 1** shows the location of these systems across Florida.

At the end of the FOSNRS project, the consulting firm provided several technical recommendations for future refinement based on the conclusions drawn from the study. One of the recommendations was that, while the 18-month sampling period was long enough to establish the treatment performance of the systems, long-term performance and reliability of these systems and designs remained to be evaluated. It is critical that FDOH establishes a long-term monitoring schedule for these home systems so that the knowledge can be obtained about the continued system performance, the longevity of media, the nitrogen removal efficiency as these systems become mature, and the overall maintenance and life-cycle cost of these systems. Results from the continued monitoring will provide guidance for system design refinements and long-term needs for maintenance and monitoring as well as ensure successful application of these types of systems in the entire state to effectively control the nitrogen loads to Florida aquifers and surface waterbodies. This recommendation constitutes the goal of this proposed continued monitoring project.

**Table 1. Key Information Related to the Tested Two-Stage Biofiltration OSTDS at the Selected Residential Sites**

System	System Description	County Where System Located / TMDL / BMAP	64E-6 Design Flow (gpd)	Stage 1 Operation	Mean Influent TN (mg/L)	Mean Effluent TN (mg/L)	Mean TN Removal Efficiency (%)	Mean Power Use (kWh/day)	Total Construction Cost (\$)
BHS-1	Proprietary: Stage 1 Aerocell™, Stage 2 Nitrex	Wakulla / Wakulla BMAP	300	Recirculation to tank	82.7	7.1	91	3.21	18,606
BHS-2	In-tank two stage biofilter with stage 1 recirculation, dual media stage 2, lignocellulosic (2a) followed by elemental sulfur (2b)	Hillsborough / Bullfrog Creek TMDL	400	Recirculation to tank	50.5	3.5	93	0.31	18,056
				Recirculation to top of Stage 1 media	57.8	1.8	97	0.26	
BHS-3	In-ground stacked biofilter, single pass stage 1 cover stage 2a with supplemental stage 2b tank; stage 2a lignocellulosic/sand mixture; stage 2b elemental sulfur tank	Seminole / Little Wekiva River TMDL / Wekiva BMAP	580	Drip single pass	50.5	1.9	96	0.98	32,116
BHS-4	In-tank two stage biofilter with single pass stage 1, dual media stage 2; lignocellulosic (2a) followed by elemental sulfur (2b)	Seminole / Wekiva River TMDL / Wekiva BMAP	400	Single pass	70.1	7.4	89	0	16,097
BHS-5	In-tank two stage biofilter with single pass stage 1, dual media stage 2; lignocellulosic (2a) followed by elemental sulfur (2b)	Seminole / Wekiva River TMDL / Wekiva BMAP	500	Single pass	70.8	2.3	97	0.04	18,295
				Recirculation to top of Stage 1 media	75	1.8	98	0.14	
BHS-6	In-tank vertically stacked biofilter, single pass stage 1 over stage 2a with supplemental stage 2b tank; stage 2a lignocellulosic; stage 2b elemental sulfur tank	Wakulla / Wakulla BMAP	300	Single pass	66.3	12.4	81	0.48	10,399
BHS-7	In-ground stacked biofilter, single pass stage 1 over stage 2 lignocellulosic	Marion / Upper Ocklawaha BMAP / Silver Springs BMAP	300	In-ground low pressure distribution	54.9	19.1	65	0.04	10,516



Figure 1. General Locations of the Tested Two Stage Biofiltration OWTS

The overall goal of the proposed continued monitoring project is to collect information about the tested OSTDS described above to help establish long-term performance of the passive two-stage biofiltration technology under field conditions and provide guidance for possible design refinement and large scale implementation of the technology. To accomplish this goal, several objectives are identified:

Continue monitoring the performance of the systems, identify issues with design, system components, and operation and maintenance procedures that may cause malfunctions and underperformance of these systems.

Continue monitoring the operation and maintenance cost of the systems to verify the derived long-term cost estimated using the life-cycle cost analysis tool developed in the FOSNRS contract.

Continue monitoring the concentrations of different nitrogen species at designated sampling locations to evaluate the dynamics of nitrogen removal rate as these systems become established and mature.

Identify possible environmental or operational factors that may influence the nitrogen removal efficiencies of these systems.

Continue monitoring the concentrations of other water quality constituents, including biochemical oxygen demand (BOD<sub>5</sub>), total suspended solids (TSS), total phosphorus (TP), orthophosphate (PO<sub>4</sub>), and the abundance of indicator bacteria such as fecal coliform and E. coli. Results from the monitoring project will provide more information regarding the overall performance of these nitrogen removal systems in removing these priority pollutants from residential sewage.

To meet these objectives a combination of field parameter collection and system monitoring is planned at five of the seven sites tested through the FOSNRS project (**Table 1**), which include one site in Marion County (BHS-7), three sites in Seminole County (BHS-3, BHS4, and BHS-5), and one site in the Hillsborough County (BHS-2). The two systems in Wakulla County (BHS-1 and BHS-6) were discontinued at the end of the FOSNRS study. Water quality samples from each site will be collected for the septic tank effluent, effluent after treatment by the passive two-stage nitrogen biofiltration system, and any intermediate locations along the treatment train where possible and applicable. Sampling points will be kept the same as those being sampled during the FOSNRS project so that the newly collected data can be compared with the historic data to derive the long-term performance.

**Table 2** shows the web links to a set of FOSNRS monitoring reports describing the system design and sampling points for all five systems included in this project. The data sets generated will enable quantification of hydraulic, organic, and nitrogen loading rates; average influent and effluent concentrations; removal efficiencies for nitrogen and other parameters; and effluent nitrogen concentrations achieved. System performance on removing other priority pollutants can also be quantified and compared to the historic data for the long-term performance evaluation. Documentation of system status, operation and maintenance procedures and costs, and system performance issues will also be documented throughout the continued monitoring project. The monitoring will initiate as soon as the funding becomes available and will last for two years. Field parameters and water quality samples from these systems will be collected on a quarterly basis.

**Table 2. Documents Providing Details on System Structure and Sampling Design**

System	Documents Providing Detailed Description on System Structure and Sampling Design
BHS-2	<a href="http://www.floridahealth.gov/environmental-health/onsite-sewage/research/b7b1.pdf">http://www.floridahealth.gov/environmental-health/onsite-sewage/research/b7b1.pdf</a>
BHS-3	<a href="http://www.floridahealth.gov/environmental-health/onsite-sewage/research/b7c1.pdf">http://www.floridahealth.gov/environmental-health/onsite-sewage/research/b7c1.pdf</a>
BHS-4	<a href="http://www.floridahealth.gov/environmental-health/onsite-sewage/research/b7d1.pdf">http://www.floridahealth.gov/environmental-health/onsite-sewage/research/b7d1.pdf</a>
BHS-5	<a href="http://www.floridahealth.gov/environmental-health/onsite-sewage/research/b7e1.pdf">http://www.floridahealth.gov/environmental-health/onsite-sewage/research/b7e1.pdf</a>
BHS-7	<a href="http://www.floridahealth.gov/environmental-health/onsite-sewage/research/b7g1.pdf">http://www.floridahealth.gov/environmental-health/onsite-sewage/research/b7g1.pdf</a>

**Task 1: Inspection and Monitoring:**

This task will be focused on inspecting the nitrogen removal systems, collecting field parameters and water quality samples, and conducting routine and non-routine maintenance. **Table 3** shows a general inspection and monitoring schedule for this project. Inspection and monitoring include checking the status of various components of these nitrogen removal systems to ensure proper functions, monitoring the flowrate and volume of wastewater treated; documenting energy, chemical, or additives consumption; conducting chemical and microbiological sampling; and identifying system operation issues and addressing them accordingly.

**Table 3. General Monitoring Schedule Framework**

Task	Nominal Frequency	Actions	Product
Site Inspection	Quarterly	Visual inspection; ascertain operability; odors; read meters; examine drainfield observation ports	Completed inspection checklist; log entries; meter readings
Flow/volume	Quarterly	Record flow/volume meter; make spreadsheet entry	Updated flow/volume records; average daily volume calculation
Energy, chemical, or additives consumption	Quarterly	Record energy meter, chemical or additives use; make spreadsheet entry	Updated energy, chemical or additives records; average daily use and use per volume calculation
Routine maintenance by project personnel or maintenance entity	Per vendor recommendations or recommendations of project team	Perform routine maintenance actions	Maintenance log entries
Task	Nominal Frequency	Actions	Product
Non-routine maintenance	As needed	Identify problem and perform non-routine maintenance actions	Maintenance log entries: documented cause of problem, action taken, cost of parts and labor
Chemical and microbiological sampling	Quarterly	Monitor chemical and microbiological parameters in	Data set of chemical and microbiological parameters; log of removal efficiencies

		influent, effluent and intermediate process points where applicable; make spreadsheet entries	and effluent concentrations for total nitrogen, nitrogen species, and other water quality parameters
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### Checking the status of system components

(1) Observe and record the general appearance/functioning of the treatment system.

Are there any signs of surfacing or breakouts near the treatment system?

Are tanks, lids, or access covers broken or missing?

Are there any signs of settling or erosion near the system components?

Is the system subject to vehicular traffic?

Is there any encroachment onto the system? If yes, what is within 5ft of system?

Evaluate presence of odor within 10ft of perimeter of system.

Are any alarms on?

(2) Observe if system has been altered or the site has changed since approval.

Any landscape construction, utility work, or changes in drainage patterns?

Has system been obstructed?

Any apparent recent additions to the building(s) connected to system?

Are any components missing or modified?

(3) Observe that there is power to the system.

Is control panel for treatment system visible?

Is control panel for treatment system accessible?

Does power indicator, if present, indicate that power is on?

Does operation of system indicate that power is on?

Does it appear that the power is switched off?

(4) Observe that there is an alarm and, if possible, test it.

(5) Observe the drainfield area and record conditions.

Are there any trees in the drainfield?

Relative to surrounding areas, how does the vegetation on the drainfield look?

Is there evidence that there is ponding in the drainfield?

(6) Observe the status of the treatment train

documenting the sludge and scum accumulation in the septic tank

checking the outlet filter to ensure no clogging

checking the stage one bio-filter tank if applicable to ensure unsaturation of the media

checking the stage two bio-filter tank to ensure saturation of the media

checking the sulfur tank to ensure that the effluent water is clean

### Monitoring and sample collection

#### Flow and Volume

A flow/cumulative volume meter will be checked to measure flow to the treatment system. Most of the systems to be monitored in this project have a flow meter installed to document the total flow from

the house entering these nitrogen removal systems. Some systems also include flow meters to document water recycled and water discharged to the next components of the treatment train. Readings from all meters will be documented to estimate the hydraulic loading rate to each system component.

#### Energy, Chemical and/or Additives Consumption

Energy consumption will be documented based on readings of the electrical meter installed on the power line to provide cumulative kW-hour used for all energy requiring system components. Any chemical and/or additives use will be tracked by recording the volume or mass of these items supplied for system operation.

#### Chemical and Microbiological Analyses

The sample collection will generally follow the approach that was implemented in the FOSNRS project (<http://www.floridahealth.gov/environmental-health/onsite-sewage/research/a15.pdf>). Where possible, monitoring will be based on collecting samples manually from septic and treatment tanks or through in-line sampler pipes installed on outlet pipes of treatment components. Where necessary, samples will be collected using a peristaltic pump. Samples will be collected from the influent to the treatment system, which is onsite primary effluent, also known as septic tank effluent (STE). Effluent samples (i.e. final effluent) will be collected from the final treatment system component (e.g. denitrification biofilter effluent in a two-stage passive biofiltration process) and result in the final effluent quality for TN and individual nitrogen species. Intermediate sample collection will be conducted at sampling locations described in the documents tabulated in **Table 2**. For example, monitoring the effluent from an aerobic biological process before it enters a denitrification biofilter can be used to assess nitrification performance and reduction in CBOD<sub>5</sub>.

Chemical and microbiological parameters to be analyzed by NELAC-certified laboratories are listed in **Table 4**. The parameter list includes total Kjeldahl nitrogen (TKN), ammonia nitrogen (NH<sub>4</sub><sup>+</sup>-N), and oxidized nitrogen (NO<sub>3</sub>+NO<sub>2</sub>)-N for delineation of nitrogen speciation; total suspended solids (TSS); bulk organic matter as CBOD<sub>5</sub>, and total organic carbon (TOC); total phosphorus (TP) and orthophosphate; sulfate, sulfide, and hydrogen sulfide (H<sub>2</sub>S) for technologies employing sulfur based biofiltration for denitrification; and fecal coliform (fc) and E. coli as microbiological indicators. Supporting inorganic parameters including temperature, pH, alkalinity, dissolved oxygen (DO), turbidity, and oxidation reduction potential (ORP) will be measured onsite using field equipment, such as a YSI multiple parameter data logger. The sample collection, equipment cleaning, and other field quality assurance/quality control (QA/QC) processes will all follow FDEP SOPs.

**Table 4. Chemical and Microbiological Parameters**

Systems	Sample points	Analytes
All systems	Influent, effluent, intermediate point(s) where applicable	Temperature
		pH
		DO
		ORP
		Alkalinity
		TKN



		NH <sub>4</sub> <sup>+</sup> -N
		(NO <sub>3</sub> +NO <sub>2</sub> )-N
		TSS
		CBOD <sub>5</sub>
		TOC
		Total phosphorus
		Orthophosphate
		E. coli
		Fecal Coliform
Sulfur denitrification biofilters	Influent and effluent	Sulfate
		Sulfide and H <sub>2</sub> S

For multiple point monitoring, sample collection will generally be conducted starting with the downstream most point and proceeding to all upstream points. This eliminates the effects of upstream sampling on downstream effluent quality. Whenever possible, field parameter measurements that employ probes will be taken by direct probe placement into locations within the treatment train. However, where sewage is not directly accessible, the field measurements will be taken on aliquots of samples taken in an intermediate container. Sample collection, handling and analyses methods will be in accordance with the Florida Department of Environmental Protection (FDEP) Standard Operation Procedures (SOPs).

## Routine and Non-Routine Maintenance

Full documentation will be maintained of routine and non-routine maintenance activities under the actual operating conditions. Routine maintenance refers to scheduled activities that are recommended by the design engineer. Non-routine maintenance relates to equipment breakdowns and malfunctions requiring operator attention.

## Task 2: Chemical and Microbiological Analyses

All chemical and microbiological samples collected through this project will be analyzed by commercial analytical laboratories. The selected laboratories will be those certified by the National Environmental Laboratory Accreditation Program (NELAP) on the water quality constituents included in this project, being price competitive, and in locations that allow this project to meet the required sample holding time. These commercial laboratories will be responsible for providing the FDOH project team the needed sample containers, preservatives, filters, pre-filled labels, chain of custody forms, and delivery these needed supplies to a location identified by the FDOH project team. The project team will be responsible for collecting the samples, preserving these samples properly, and deliver them to the selected laboratories to ensure holding time compliance. The selected laboratories will be responsible for analyzing the water quality constituents using the standard methods identified by the FDOH project team (**Table 5**) and providing data reports to FDOH within three weeks after receiving the samples.

**Table 5. Water Quality Constituents and Analytical Methods for This Project**

Analysis per Attachment I	Required Method Detection Limit	Method of Analysis
Five-Day Carbonaceous Biochemical Oxygen Demand (CBOD <sub>5</sub> )	2 mg/L	SM 5210B
Chemical Oxygen Demand (COD)	10 mg/L	EPA 410.4
Total Kjeldahl Nitrogen (TKN-N)	0.05 mg/L	EPA 351.2
Ammonia Nitrogen (NH <sub>3</sub> -N)	0.005 mg/L	EPA 350.1
Nitrate Nitrogen (NO <sub>3</sub> -N)	0.01 mg/L	EPA 300.0
Nitrite Nitrogen (NO <sub>2</sub> -N)	0.01 mg/L	EPA 353.2
Nitrate + Nitrite Nitrogen (NO <sub>x</sub> -N)	0.02 mg/L	EPA 353.2
Total Phosphorous (TP)	0.01 mg/L	EPA 365.1
Orthophosphate as P (Ortho P)	0.01 mg/L	EPA 300.0
Sulfate (listed as IC Anions on invoice)	2.0 mg/L	EPA 300.0
Unionized Hydrogen Sulfide	0.10 mg/L	SM 4500S2H
Hydrogen Sulfide (unionized)	0.01 mg/L	SM 4550SF
Analysis per Attachment I	Required Method Detection Limit	Method of Analysis

Total Suspended Solids (TSS)	<u>1</u> mg/L	SM 2540D
Total Organic Carbon (TOC)	<u>0.06</u> mg/L	SM 5310B
Total Alkalinity	$\leq 20$ mg/L CaCO <sub>3</sub>	SM 2320 B
Fecal Coliform	<u>1</u> cfu/100 mL	SM 9222D
E. coli	<u>2</u> cfu/100 mL	SM 9223B

### Task 3. Data Analyses

All field parameters collected and water quality data provided by the laboratories will be compiled in a Microsoft Excel spreadsheet. These newly collected data will be combined with the data set collected by the FOSNRS project. The following data analyses will be conducted to fulfill the goal of this project:

Concentrations of nitrogen species from different components of the treatment train will be compared to evaluate the performance of nitrification and denitrification through the treatment train. The overall system nitrogen removal rate will be estimated by comparing the TN concentration from the septic tank effluent to the TN concentration of the final effluent from the treatment train. CBOD<sub>5</sub> and alkalinity concentrations will be analyzed in tandem with the nitrogen concentration analyses to elucidate the oxidation efficiency of the stage-one bio-reactive media and the sufficiency of alkalinity in support of the nitrification. For treatment systems installed under the drainfield, specific conductivity data will be used to evaluate the potential groundwater dilution effect on the decrease of nitrogen concentration in the final effluent of the treatment train. DO concentration and ORP throughout the treatment train, especially at the stage-one and stage-two media, to evaluate the redox status of the bio-reactive media for proper nitrification and denitrification. Results from analyzing these non-nitrogen parameters will help better understand the factors that influence the nitrogen removal process of the treatment train. Whether nitrogen removal efficiencies of these systems are influenced by hydraulic loading rates and pollutant loads entering these systems will also be analyzed by looking at the relationship between septic tank effluent concentration and loads (flow times concentration) and the final treatment train effluent concentration and overall system removal rate. In addition, sulfide concentration from the effluent of the treatment train will be analyzed to ensure that the concentration does not exceed the sulfide groundwater criteria.

Concentrations of CBOD<sub>5</sub>, TSS, TP, fecal coliform, and E. coli from different parts of the treatment train will be analyzed, and the concentrations of these parameters in the septic tank effluent will be compared to those of the final treatment train effluent to evaluate the overall removal efficiencies of these parameters by the nitrogen removal systems.

Descriptive statistics of nitrogen species concentrations and nitrogen removal rate, including mean, medium, and standard deviation, will be estimated to evaluate the central tendency and variance of the treatment processes. The Student T-test will be used to compare the descriptive statistics of the data collected during this project to those collected during the FOSNRS project to evaluate, after being

installed for five to six years, whether nitrogen removal efficiencies of these systems are significantly different from when they were originally installed. Trend analyses will also be conducted using all the data points from both this project and FOSNRS project to evaluate whether a significant temporal trend of nitrogen removal can be identified when these systems become mature. The two-sample mean comparison and trend analysis will also be conducted on the non-nitrogen water quality parameters described in item 1 to help better understand the factors that may influence the temporal trend of the nitrogen removal efficiencies. All observations obtained through system inspection will also be included in these analyses to assess whether the observed trends are mainly influenced by the system maturing processes or by how these systems are operated and maintained.

Similar two-sample mean and trend analyses will also be conducted on CBOD<sub>5</sub>, TSS, TP, fecal coliform, and E. coli to evaluate the temporal trend of the removal efficiencies of the other priority pollutants.

Information obtained through system status inspection will be evaluated to identify any potential issues that may have been caused by either system operation, maintenance, or system design to provide guidance on the future refinement needs of operation, maintenance, and design.

Cost information related to system operation and maintenance will be analyzed to refine the life-cycle cost analyses of these nitrogen reducing systems.

#### **Task 4. Reporting**

Develop and publish the project schedule

Develop and maintain a project task list for day-to-day activities derived from the high-level tasks in the project schedule

Provide regular reporting on planned versus actual expenditures upon approval of the project budget

Identify recommendations for improvements/enhancements and limitations/challenges for subsequent work

Prepare and publish annual project status reports including tracking of baseline project milestones, executive summaries of completed work during the current reporting period, planned work for the upcoming reporting period, risks that require assessment and mitigation strategies, and issues that require intervention from the project owner, sponsors, or other executive leadership

Prepare draft final project report summarizing project accomplishments, recommendations for the future, lessons learned, and any deviations from the project schedule and task list for review by the Department and other interested parties

Prepare final project report summarizing project accomplishments

Describe educational activities that are part of the project.

One of the key aspects of developing OSTDS remediation plan is to identify and select the most cost-effective nitrogen removal systems with sufficient nitrogen removal efficiencies. Therefore, the availability of OSTDS nitrogen removal technologies, their general performance, long-term reliability, maintenance needs, and life-cycle costs of the available technologies constitute key information for water resource managers, local governments, and stakeholders. Results from this project can be incorporated into FDOH information presentations to BMAP public meetings and workshops to educate local stakeholders and decision makers. Observations and conclusions from this project can also be incorporated into

training programs to prepare county health department staff and septic tank industry workers for the large-scale implementation of these nitrogen removal systems to help restore nutrient impaired Florida waterways.

Objective:

Numerous studies conducted nationwide as well as in Florida have indicated that, if constructed and maintained properly, OSTDSs can be very effective in removing most priority pollutants from domestic wastewater, such as DO, consumptive organic carbon, suspended solids, phosphorus, and many pathogenic organisms. However, it has also been established that conventional OSTDSs that include only a septic tank and drainfield, are not the most effective technology to remove nitrogen. In Florida, in many BMAP basins of Outstanding Florida Springs impaired for nutrients, OSTDSs contributed close to or more than 20% of the total nonpoint source nitrogen. Controlling the nitrogen loads entering Florida groundwater from conventional OSTDSs is an important step to restore nutrient impaired springs recognized by legislature, state, county, and local governments, environmental interest groups, home developers, septic tank industry representatives, and academic communities. Choosing cost-effective nitrogen removal technologies with sufficiently high nitrogen removal efficacy is considered one option to reduce nitrogen loads entering the groundwater aquifer, especially for those areas not having easy access to the service network of wastewater treatment plants. However, the OSTDSs specifically designed to remove nitrogen with high removal efficiencies have not been widely applied in the state of Florida. Information and data about the performance of these systems are scarce, especially information and data regarding the long-term performance, reliability, maintenance needs, and life-cycle costs. This project, once successfully completed, will provide critical information and guidance to improve the implementation and refinement of these nitrogen removal systems, and help build confidence within the septic tank industry, environmental interest groups, and impacted homeowners in using these technologies and designs to reduce the nitrogen loads and help facilitate achieving the Total Maximum Daily Load (TMDL) to restore impaired Florida waters.

Project Effectiveness Evaluation:

Project success criteria and key performance indicators (KPI) include:

All proposed inspection and monitoring activities are accomplished.  
Collected water quality samples are properly analyzed based on FDEP SOPs and using proposed analytical methods.  
Analytical results and QA/QC processes are properly documented.  
All proposed data analyses are conducted.  
All required reports are prepared, and submitted to, and approved by FDEP.

These criteria and KPI will be evaluated through routine progress reporting on the project.

4. If the grant and match funded project is part of a larger project, describe the overall project and include the cost of the overall project in this description. Also include how long the overall project will take to complete.

This is a standalone project.

5. Project Funding and Timeline for Only the Grant and Committed Match Funded Portions.

In the table below, provide the estimated funding amounts and timeline (in months) for each grant and committed match funded step in the project. Examples of typical descriptions have been provided but can be edited as needed.

Description	Grant Funding	Match Funding	No. of months to complete task
First sampling trip: including sample collection trip, supplies, sample analyses, and data analyses	\$7,015	\$4,677	Month 1 to Month 3
Second sampling trip: including sample collection trip, supplies, sample analyses, and data analyses	\$7,015	\$4,677	Month 4 to Month 6
Third sampling trip: including sample collection trip, supplies, sample analyses, and data analyses	\$7,015	\$4,677	Month 7 to Month 9
Fourth sampling trip: including sample collection trip, supplies, sample analyses, and data analyses	\$7,015	\$4,677	Month 10 to Month 12
Annual report	\$1,385	\$924	Month 12
Fifth sampling trip: including sample collection trip, supplies, sample analyses, and data analyses	\$7,015	\$4,677	Month 13 to Month 15
Sixth sampling trip: including sample collection trip, supplies, sample analyses, and data analyses	\$7,015	\$4,677	Month 16 to Month 18
Seventh sampling trip: including sample collection trip, supplies, sample analyses, and data analyses	\$7,015	\$4,677	Month 19 to Month 21
Eighth sampling trip: including sample collection trip, supplies, sample analyses, and data analyses	\$7,015	\$4,677	Month 22 to Month 24
Final report	\$2,495	\$1,660	Month 23 to Month 24
<b>TOTAL</b>	<b>\$60,000</b>	<b>\$40,000</b>	

Total Number of Months for the Project: 24

#### ESTIMATED POLLUTANT LOAD REDUCTIONS

This proposal is for a **structural BMP** project.

☒ Yes ☐ No

If the answer is yes then enter the estimated load reductions and event mean concentrations (EMCs) in the Pollutant Load Reduction table and enter the name of the model below.

The nitrogen removal efficiencies of the five systems to be monitored in this project, based on data collected by the FOSNRS project, ranged from 65% to 97%

Name of the model used for determining the load reductions:

If EMCs are not the primary parameter of the model, describe the source and type of the model information.

The nitrogen removal efficiencies presented here were estimated based on comparing the nitrogen concentration collected from the septic tank effluent and final effluent of the entire treatment train. They were not estimated through modeling.

Does the project utilize innovative technologies/BMPS?

All OSTDSs included in this project include a two-stage passive bio-reactive media system, which facilitates the nitrification and denitrification processes of the treatment train to achieve high nitrogen removal efficiencies. Some systems included in this project also recycle the nitrified wastewater and, therefore, further improve the nitrogen removal efficiencies. The passive two-stage bio-reactive media technology has not been widely used in the state of Florida to control nitrogen loads.